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ABSTRACT

Mercer County Community College (MCCC) in Trenton, New Jersey, and two local companies (The Trane Company and The Hibbert Group) collaborated on a job-focused, competency-based curriculum to develop literacy competence and English communication capability among native English speakers and speakers of English as a second language (ESL) working at Trane and Hibbert. After a Developing a Curriculum (DACUM) process was conducted to determine the potential students' specific job needs, a curriculum and course modules that included instruction in the following areas were developed: basic blueprint reading, business writing, communication on the job, documentation, ESL, making the most of the work day, math on the job, presentation skills, problem solving, reading comprehension, time management, stress management, and telecommunications. MCCC trained more than 500 employees. As a result of participating in the program, many employees improved their English communication skills, self-esteem, understanding of work assignments, and job-coping skills. (An external evaluation, study of the effects of workplace education, and a sample lesson are included. Appendixes constituting more than half the document contain the following: course outlines, orientation material, schedule, survey, individual education plan, project-related correspondence and newspaper articles, and training material.) (MN)

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ED 368 968

Final Evaluation

Mercer County Community College
Workplace Skills Project
#VA198A2090
(September 1, 1992 - February 28, 1994)

MERCER
COUNTY
COMMUNITY
COLLEGE

TRENTON • NEW JERSEY

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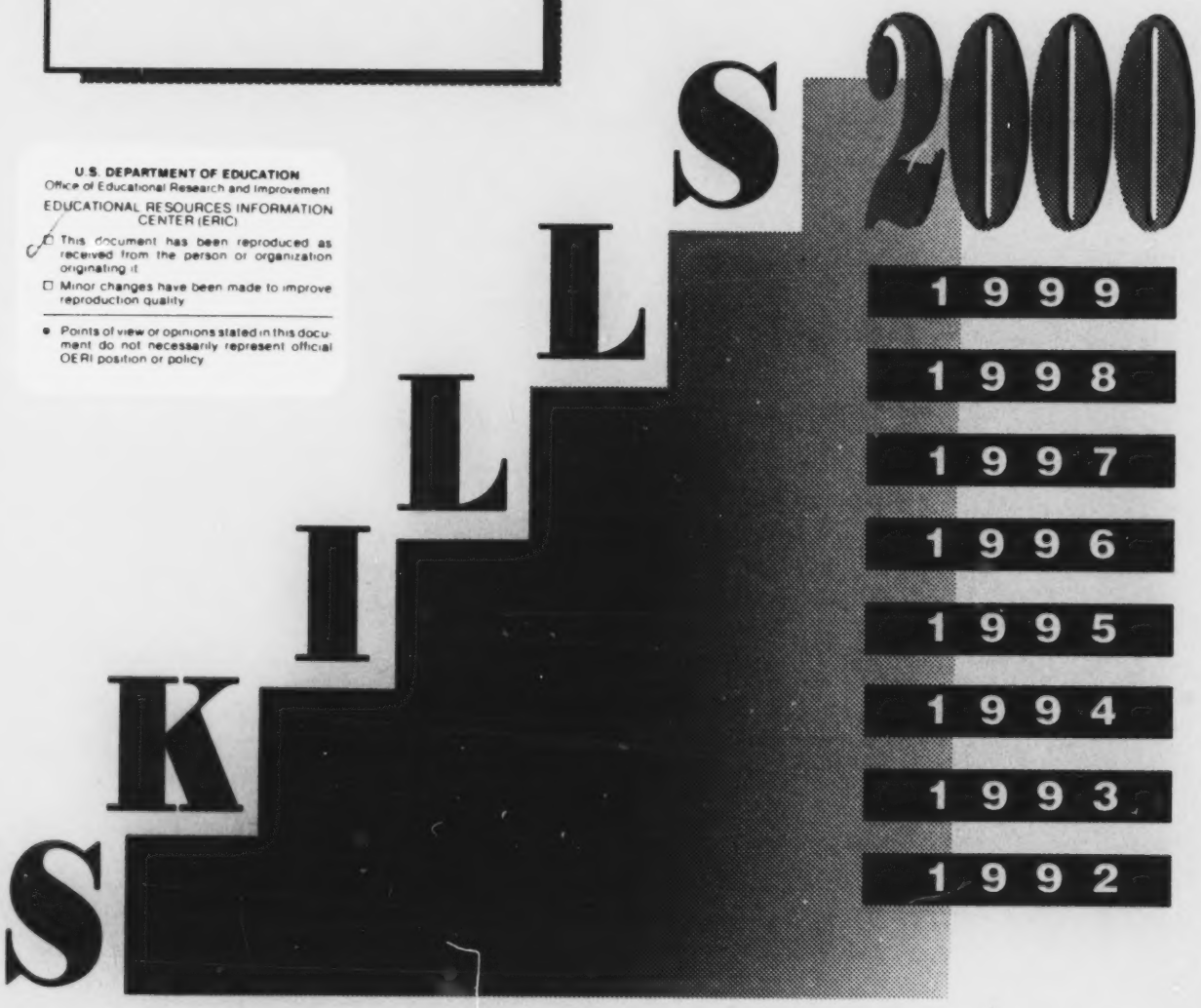

CE 066 398

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Mercer County Community College

Workplace Skills Project

Grant Period: September 1, 1992 - February 28, 1994

FINAL EVALUATION

Project Number VA198A2090

Funded by the US Department of Education

SUMMARY SHEET

1.	**PROGRAM TITLE:**	Workplace Literacy and English Language Skills
2.	**AWARD NUMBER:**	VA198A2090
3.	**PROJECT DIRECTOR AWARDEE/ADDRESS/ TELEPHONE:**	Elaine S. Weinberg Mercer County Community College 1200 Old Trenton Road Trenton, NJ 08690-1099 (609)586-4800 EXT. 612 Fax - (609)890-6338
4.	**FUNDS BY FISCAL YEAR:**	Federal: FY 1992 $448,853 Non-Federal: $393,517 Federal Funds - 47% of total funds
5.	**AWARD PERIOD:**	September 1, 1992 - February 28, 1994
6.	**FEDERAL PROJECT OFFICER:**	Elizabeth Miller, USDE (202) 732-2357
7.	**OBJECTIVE:**	To develop workplace literacy competency and English communication capability among ESL and English speaking workers in a factory and a service industry.
8.	**PROCEDURES:**	MCCC performed an initial needs assessment to target specific concerns. Results indicated that both oral and written communication were a primary target for remediation. In addition, all basic literacy skills had to be addressed within the companies' changing environments. In response, job-focused, competency-based curricula were developed after determining specific job needs through a DACUM process. A counselor worked with students to assure that their goals were met.
9.	**OUTCOMES/RESULTS/: PRODUCTS**	The College trained 500 employees to have job functional skills that helped increase their productivity, job retention, and career advancement potential. Course modules were developed and disseminated. Employees improved English communication skills on the job, and benefited from increased self esteem, improved understanding of work assignments and job coping skills.
10.	**EDUCATIONAL LEVEL:**	Ranged from ABE through 12+

11.	**TARGET POPULATIONS:**	Specific job categories within each company
12.	**EXPECTED NUMBER OF TRAINEES:**	600
13.	**PARTNERS:**	The Trane Company and The Hibbert Group

Project Abstract

This project developed a model workplace literacy program for a manufacturing and a service industry that can be replicable at other worksites. Products of the project include: 1) job specific workforce literacy curriculum for adults, 2) learning modules for literacy workplace partners, 3) a model of DACUM charts for developing job related competency skills, and 4) evaluation model for assessing program competencies.

This project was accomplished through a partnership with the Trane Company (Trane), the Hibbert Group (Hibbert) and Mercer County Community College (Mercer) in Trenton, New Jersey. The entire instructional program was developed and implemented with the assistance of company personnel and was intended to serve 600 adults with many limited communications or English language proficiencies. Specifically, employees were recruited, assessed, and place in one of three levels of instruction: entry, intermediate, or advanced. Classes were held for two hours, twice a week at the two plants in Trenton throughout the fifteen months allotted for instruction. Instruction included reading., writing, math, communication (i.e., listening, speaking), English as a Second Language, and interpersonal skills development. Problem solving, critical thinking and reasoning skills were integrated into the curriculum. The content for the instruction was job-specific and fostered independent learning skills. Academic counseling was provided for participants in the project.

The project utilized a comprehensive and on-going evaluation plan to determine its effectiveness. Successful implementation of this project not only provided significant benefits in job continuation and advancement to Trenton's labor force, but also provided a model for the nation in light of changing demographics of the workplace.

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I. Establishing and Maintaining Partnership

The Partnership

Mercer County Community College and its two business partners, The Trane Company and the Hibbert Group, were fully committed to making this project a success. Each entity considered this project a part of a larger effort to link the experience and expertise of the college with the training needs of the industry. Trane is one of the fastest growing industrial employers in the Trenton area. This manufacturer of furnaces and air conditioning units represents the smokestack manufacturing industries that were once the predominant employers of lower-skilled workers in the metropolitan area. Hibbert responds to industry's needs for data and marketing services. The company struggles to recruit and retain workers because of the communication and literacy demands required of its workers. Mercer has extensive experience conducting work site programs and developing customized training programs for business and industry. Over the past several years, the college has worked with both partners in the literacy project to provide other programs to their workforces. This prior experience encouraged the openness of communication that was required to develop a strong partnership.

Once the grant began each partner made a significant contribution to the program and was committed to the ongoing success of the program. During the short grant period Trane and Hibbert contributed $364,284 in in-kind contributions. They felt that as each industry moves towards high technology in the application of its work, the necessity for the development of a workforce with strong skills and high levels of functional literacy was critical.

Although the two organizations had diverse literacy needs, the college addressed this diversity in a contextual approach to literacy that merged basic skills to tasks at work. The project was directly related to literacy requirements and actual jobs at the two sites. By establishing a partnership among an educational institution, a manufacturer, and a service industry, the project included all the elements that were required to develop a program that can be replicated in a wide range of workplaces.

The college provided a strong support service program in conjunction with the instructional workplace literacy program to increase retention. Employee participants were assessed and individual education plans were developed in conjunction with the educational programs. Both formative and summative evaluation procedures were used to assess specific program objectives.

Responsibility of Each Partner

As in any good partnership, each partner was responsible for specific tasks. Mercer County Community College was responsible for the following:

- Conducting needs assessment
- Developing curriculum
- Developing and administering assessments
- Developing instructional materials and modules
- Developing personal development workshops
- Producing instructional guides
- Providing orientation
- Providing counseling, advisement, referral and follow-up services
- Conducting over-all evaluations
- Hiring and supervising project staff
- Ordering and maintaining equipment
- Providing grant administration and monitoring services
- Providing instruction on the company sites
- Contracting for external evaluation
- Evaluating curriculum materials

Trane and Hibbert were responsible for the following:

-Providing planning teams for task analysis, curriculum development and evaluation
-Providing work related materials for curriculum development
-Providing training facilities
-Recruiting employees
-Providing data on employee job performance and attainment
-Conducting site specific evaluations
-Testing replicability of the model literacy project for other employee groups
-Providing release time for employees to attend classes
-Continuing development and implementation of the program at the end of the grant period

The Advisory Committee

Each company selected a panel of employees from all levels of salaried and hourly staff to help customize the program for their organization.

The Advisory Committee was responsible for the following:

- -Providing information which helped update, modify, expand and improve the quality of the program
- -Making recommendations to strengthen the curriculum
- -Identifying needs, determining priorities and reviewing and evaluating the program
- -Recruiting students
- -Acting as a liaison between the employees and the college to assure that all needs were being met

Organizational Procedures

To implement the program Mercer analyzed the jobs and/or tasks targeted for this project using a functional context orientation. Since the industries who joined Mercer in partnership were dissimilar, the curricula and job-specific assessments developed differed by industry. The college conducted a literacy audit at each company to identify the specific skills required for each job category targeted by Hibbert and Trane for basic skills upgrade training. Then we documented the literacy needs of employees and the literacy demands of jobs. The audit process involved on-the-job observations of workers performing a job, interviews with employees in targeted jobs, discussions with supervisors, and the collection and analysis of the written materials used in or required for those jobs (e.g. manuals, blueprints, reference charts, certification examination materials, occupational safety materials, materials labeling, etc.). Training materials were developed that were sensitive to the learners' workplace literacy needs and incorporated the literacy skills necessary to specific jobs. The relevance of this alignment between the learners' work experience and the development of training materials was a key to the success of this program. It made the program meaningful to the workers by incorporating theoretical knowledge with practical skills on the job. In essence, it made learning more adult orientated and created a new avenue for employees to be effective learners.

In addition, a DACUM (Developing a Curriculum) process was employed to itemize the tasks involved for each job and the knowledge required to be competent in that work. Using this information, a matrix of the skills and competencies necessary for each major job type was charted. The college then used the DACUM chart to develop a curriculum that was directly linked to job requirements, skills and competencies. (See Appendix). Beyond educational benefits, the companies found information from the DACUM valuable in understanding the specific skills their workers needed. The partners allowed their workers and supervisors to participate in the DACUMs by giving them twenty-four hours of release time.

The literacy audit found that in response to marketplace pressures for quality and the challenges of global competitiveness, both of these industries have been upgrading, and are continuing to revise their methods of operation. These companies are introducing automation and computer operated machines to speed production and increase cost effectiveness. To cope with these innovations, their workers must not only have the math and literacy skills required to understand and run sophisticated machinery, but also need to develop the basic skills required for adapting to new requirements.

Although some job changes were predictable, others were not. To deal with innovations and future changes, these workers needed training to develop the global skills and over all proficiency needed for ongoing training. Flexibility, and knowing how to learn, were important skills to learn. There were many indications that these industries demanded both trained people and people who could be trained. They needed workers who were willing and able to update their present knowledge and understand new concepts. To facilitate this change in learning expectations, all curricula integrated problem solving and critical-thinking techniques.

With this information from the audit and the DACUM, Mercer customized the literacy training offered for the particular jobs targeted. The training established a replicable instructional program to develop literacy skills that were both job-specific and basic. The participants acquired functional literacy skills that increased their productivity, job retention, retrainability, and career advancement potential.

Classes were scheduled on site twice a week for two hours each session. At Trane classes ran five days a week from 8:00 am until 5:00 pm. At Hibbert classes were scheduled from 9:00 am until 3:00 pm to correspond to their shifts. Students were offered tutoring and computer reinforcement activities during the day. There were five training cycles, each three months long. Within that period there were two, six week sessions. This enabled students to join the program more easily. (See sample schedule in Appendix.)

Continuing support has been delivered in conjunction with the instructional workplace literacy program efforts were made to increase participants' retention and completion of the program. A counselor provided counseling for intake, again at mid-point and at the conclusion of the program. She was also available for intervention if a student was having difficulty or wanted to drop out of the program. In addition, the instructors were available for additional tutoring for any students who requested this opportunity.

All of this groundwork helped to develop a strong partnership with Trane and Hibbert to ensure that the project goals were accomplished and that the program would continue after the grant period ended.

II. Establishing Relevant Curriculum

Audits

The manufacturing and service industries, which have been a reliable source of employment for many people with limited education and/or limited English proficient individuals in Trenton are, as has been noted, undergoing significant changes. The gap between industry technological advances and worker skill levels clearly is being felt. Equipment is becoming more sophisticated and tasks more complex. Previously a general of the use of the equipment was necessary, but repetition was the major technique used for training employees. Now in the 1990's, the equipment is changing rapidly and becoming more computerized. This new equipment requires workers to have the ability to read and write in English and compute. There is great concern among Trane and Hibbert plant supervisors that the current workforce be prepared to utilize this new technological equipment.

In analyzing the overall skills of the workforce, the literacy audit identified the following basic skills/literacy deficiencies: oral communication, listening and speaking skills, limited English proficiency, logical/rational thinking skills, workplace sensitivity and other interpersonal skills, and basic literacy skills.

Specific areas for intervention included:

1. Communication and English Literacy

- understanding structure and content of instructions
- reading and interpreting work orders
- reading and following specifications accurately and quickly
- completing forms and documenting work processes and accomplishments
- following directions to operate complex machinery and equipment;
- reading and understanding digital output
- monitoring and verifying correctness of completed work
- recognizing form and function of particular materials

2. Graphic Literacy

- interpreting flow charts that document job processes and locating sources of errors
- understanding graphic or statistically oriented information
- reading, interpreting and following blueprints
- reading statistics-based graphs and charts, flow charts, and specification tables
- interpreting computer-generated graphs and other data information and making appropriate decisions

3. Content Knowledge

- recognizing work-related vocabulary terms that appear in instructions
- recognizing and comprehending the technical terms used in quality improvement processes

4. Numerical Literacy

- understanding specifications
- reading tool measurements required for accurate measuring (such as micrometers, calipers, etc.)
- understanding and implementing techniques required for quality monitoring and improvement

This project developed curricula to address all the needs identified through a comprehensive program that integrated needs assessment, instruction, support services, and evaluation.

Evaluation

All courses had pre-and post-test assessments to determine improvement skills. Delivered as competency-based instruction, each class session developed and reinforced a work-related task. Role plays, dialogues and team activities reinforced the skill development. Workers were asked to practice skills on the floor and assess the outcomes in the classroom.

Course Outlines

Specific course outlines are included in Appendix.

Customized Learning (See Learning Modules)

The curricula were designed specifically for adults and reflect the needs of the workplace. The training used individualized educational plans developed jointly by instructors and adult learners. The tracking, counseling, and supportive services provided for project participants was an important factor in successful training. Upon entering the workplace literacy project, the students received individualized language proficiency and literacy testing, which determined the placement of students in either entry, intermediate, or advanced levels of instruction. Each student had an orientation to the training program which included an introduction to the counseling and instruction staff, an awareness of the counseling and instructional services available, and information about future credit options. As the student progressed through training, the tracking system was used to record progress and to modify an individualized educational plan as necessary.

To insure that the worker's needs were met, the project staff conducted a literacy audit. This job analysis was a way of critically assessing the components of a given job in order to describe the job. The curriculum developers sought to describe the job, determine the required behaviors of that job, and identify the conditions under which these behaviors should occur. Particular emphasis was placed on job tasks which required reading, computation and problem solving. To gather this information, workers were observed on the job to get an understanding of the thought processes used by competent workers. Staff collected printed materials workers used, and observed methods that workers used to solved problems.

By observing and interviewing workers and examining job-related printed material, the project staff was able to better understand the demands of the job. This understanding allowed them to prepare materials designed to teach the basic skills required for each job. Other outcomes of the literacy audit included samples of printed materials that workers used on the job and job task scenarios which were used to create simulation exercises for workers. Through this comprehensive evaluation program developers saw how a competent worker thought through a task and used this information when creating instructional materials.

All training took place at the worksite, in a readily accessible environment conducive to adult learning. In designing the literacy program, considerable thought was given to the environment in which the training took place. Each of the partners and particularly the college had experience in training adult workers. Each of the partners recognized the important effects the training environment had on learning. The environment had be welcoming, physically comfortable, and supported by materials of interest and relevancy to adults.

Providing basic skills training in the workplace raised additional issues that had to be addressed. Trainers had to understand and respect the workers' needs for confidentiality regarding skill levels, educational background and perhaps even participation in a class or tutoring. The location of the training had to be easily accessible as well as comfortable and non-threatening. Training schedules had to be flexible to fit the work shifts at particular job sites.

Well equipped and comfortable training rooms were established at each site and were fully equipped with learning materials and comfortable seating. The training rooms were open throughout the normal work day. In addition, the learning resource center at the James Kerney Campus of the college was open after work hours, on weekends, and during the evening for students to drop in and continue to reinforce their learning.

III. Public Relations and Recruitment

Presentation to Workers

The workers were introduced to the training program in a series of orientations developed by the counselor to provide information, allay fears, promote enthusiasm, and encourage involvement in the program. This orientation was conducted at twenty-one separate meetings at Trane and eight meetings at Hibbert to ensure that each shift and job site got the opportunity to hear about the training program. The orientation program consisted of posters, handouts, presentation and discussion about the goals and benefits of the program. A question and answer period followed each presentation, and then workers were permitted time to sign up to speak to the counselor individually.

Notices about the program were posted around the buildings and in individual work areas. In addition, notices were included in paychecks and flyers were placed in strategic locations. Articles were included in the company newsletter. The counselor spent a considerable amount of time at each location interviewing employees and preparing them for the program. By the time information appeared about the program in the company newsletter, the teachers were setting up their office at the sites and were available for questions. (See Appendix for Orientation.)

IV Assessment, Placement and Counseling

Assessment Procedures

After recruitment, a sample of employees were scheduled for TABE testing to determine general levels of math and reading competencies. While it was difficult for the companies to release employees for the length of testing time required, they did make that commitment, and testing was accomplished.

The students, with counselor and teacher input, volunteered to be placed in classes. In most cases, the level was appropriate and the individual functioned well in the class. In several instances, the individual was unable to function in that class and was tutored individually or placed in a small group with an instructor. In addition, these people were also given special computer reinforcement materials to practice their skills. Progress in class was monitored through teacher-constructed pre- and post-tests, in-class activities, and student self-assessment.

Counseling

The counselor worked with this information to assure that students were advancing successfully and completing their stated goals. The counselor met with the employees initially to develop an IEP (individual education program) and to suggest appropriate courses available in the program. She met with the students again midway to assess their progress, and at the end of the program to assess the final progress. In addition, she was available if needed for students at risk of dropping out. (See Appendix.)

V. Hiring and Training Faculty and Staff

Hiring Procedures

Hiring full time staff for this project was a time-consuming task because great effort was made to find instructors who were not only knowledgeable in the content areas, but also had experience in training in business as well as at a college. The key to finding appropriate staff was discovering people who were flexible and could adapt to changing situations without becoming overwhelmed. The college was able to establish a core of excellent staff who were the cornerstone of the project's success.

There were several staff changes over the course of the project. Walter Meyer, who was responsible for 25% of the program's administration through the college's in-kind contribution resigned from the college and was replaced by Rose C. Nini, Dean of Corporate and Community Programs. Her considerable experience in program development and management was a valuable asset to the general oversite of this project. The project director, Elaine S. Weinberg, had 100% responsibility for project administration for the first fifteen months of this project. During the last three months, with government permission, Helene Plank, a college researcher and coordinator, replaced Ms. Weinberg so she could begin work on another federal workplace literacy grant. Ms. Patricia Carr, who was responsible for 50% time on the project for counseling, was assigned to other duties before this grant was awarded. She was replaced by Ms. Susanne Kotch, an experienced guidance counselor on staff at the college. Ms. Kotch was assisted by Ms. Ave Pollak, a certified counselor who worked part time on this project. Three full time senior education specialists and part time counselor were hired for this program to instruct reading, math and ESL. These instructors had experience and training in teaching multiple areas of basic skills, and were hired specifically for their crosstraining ability. One of these staff members, who was responsible for math instruction, was replaced half-way into the program. In addition, a full time secretary was hired for the program.

The first three months of the grant required intense staff development to gear up for the project. Only one staff person had worked in a previous workplace education program, so there were many hands-on sessions preparing curriculum, assisting in DACUMs, visiting the sites, performing

audits, and determining ways to achieve goals and meet intense schedules. Once the instruction period began, weekly meetings became a part of the staff development, and these included information on new trends developing in the field. All of the staff participated in a three day SCIDS (Systematic Curriculum and Instructional Development Workshop) workshop to learn more advanced techniques for developing job-functional curricula. The teachers, who felt isolated from the college and from other professionals in the field, often used this time to discuss class situations, new methods they developed, or ways to integrate the curriculum. In addition, all the staff went through a three-day train-the-trainer workshop at the beginning of the project to develop facilitator skills. A centralized resource library was created to provide the staff with the latest information available in the field.

VI. FORMATIVE EVALUATION PROCEDURE

Evaluation is essential to any educational process. Therefore, a significant emphasis was placed on evaluation and accountability throughout the programs. Consistent with this emphasis, the college implemented two types of evaluation design that included both formative and summative evaluation to assess the effectiveness of the total project. One evaluation was conducted through the college with the assistance of an external evaluator, Philip Ringle. The other formal research study was developed and administered by Princeton University to determine if there were any economic benefits to workplace education.

The college's internal evaluation was formative (on-going) and summative to allow for the constant monitoring and adjustment of activities to insure that they were on time and of high quality. (See Appendix).

Performance Evaluation Measures Monitoring

The project staff developed measurable performance evaluation criteria for each of the program activities. They documented all efforts and activities of the program, as well as the people served by the program in order to maintain an understanding of the effectiveness of the program as a

whole, as well as the effect on the individual. The program began with employees participating in the TABE test (Test of Adult Basic Skills) to get a base line of academic achievements. Students were interviewed by the counselor for academic needs and goals and placed in classes that best met those needs. Classes were structured with pre- and post-test assessments to obtain objective criteria for measuring the success of the program's impact.

It was impossible to obtain records that would divulge worker productivity for two reasons: 1)the union resisted any work-related data collection of individual workers, and 2) the companies tracked work improvements by lines or departments. Because not every person participated in the training, it was impossible to attribute specific improvements on a line to training or lack of training. Other factors, such as lay-offs, shift changes, new hires, and general ebb and flow of two very active companies made it difficult to quantify productivity.

However, as anticipated, as learners improved their skills that had been identified as critical to successful task completion, many bid up for new jobs, obtained these jobs, and even had salary increases. (See Princeton University Study) . Many workers at Trane can now pass qualification exams because of their enhanced literacy skills. In addition, both Trane and Hibbert report that they are undertaking industry-specific training programs in the coming year that would have been impossible to assume without their employees having taken the basic literacy training.

In addition to academic testing, questionnaires were constructed and interviews were used to collect data and reactions to activities of the program. These were given at mid point and at the end. Student information was critical to evaluate the ease of access, the relevance of materials and information, the perceived accuracy of information, the perceived values of activities, and suggestions for additional services and information. Students also completed course evaluation surveys at the end of each course to provide students with the opportunity to give input on course/instructor effectiveness and suggestions for other course choices. Almost all students felt that they had benefited from the program both at work and in their personal lives.

The benefits derived from the operation of the literacy program for the adult workers included:

- Improved communication skills both on the job and at home
- Improved understanding of work assignments and job responsibilities
- Improved job skills
- Improved self-esteem and self-worth
- Increased occupational mobility and career opportunity
- Improved employee and work site safety records
- Increased opportunity for improved standard of living
- Higher success rate on credentialing exams
- Improved communication skills within work teams

The companies benefited directly from the project by having specially tailored curricula in instruction that can be used by the partners for future training of employees. Each industry now has more skilled employees to retain and promote. The partners have also built strong, ongoing relationships with the community college upon which further cooperation can be based.

Student Achievement:

The evaluation of program was enhanced by using multiple sources of input for formative and summnative evaluation. By eliciting information from students, staff and management, in both numerical form and through observations, a more critical examination of the program resulted which allowed for continuous quality improvements.

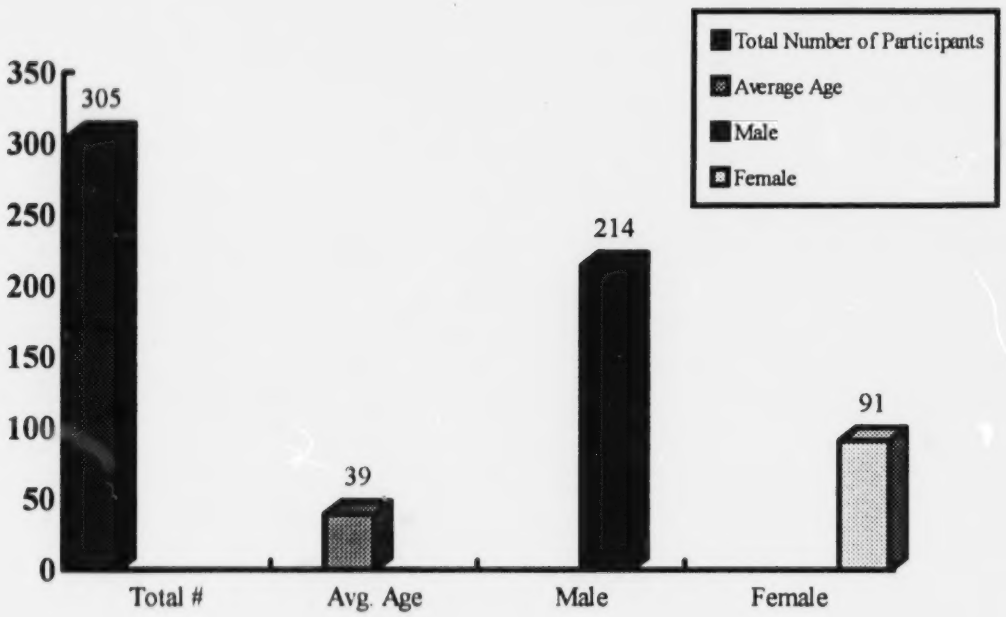
Results indicated that at the start of the project, the manufacturing company's employees were operating on 8.5 grade level in reading and a 7.7 grade level in math. The final TABE scores indicated an increase of 22% (10.4) at Trane in reading, and 21% (9.3) increase in math. Overall class scores in reading indicate a 25% increase in all content area.

The service company began with average reading scores of 8.9 grade level and math levels of 5.6. At Hibbert, there was a 12% increase (10.0) in reading and 71% increase (9.6) in math. Overall class scores in reading indicate a 20% increase in all content area.

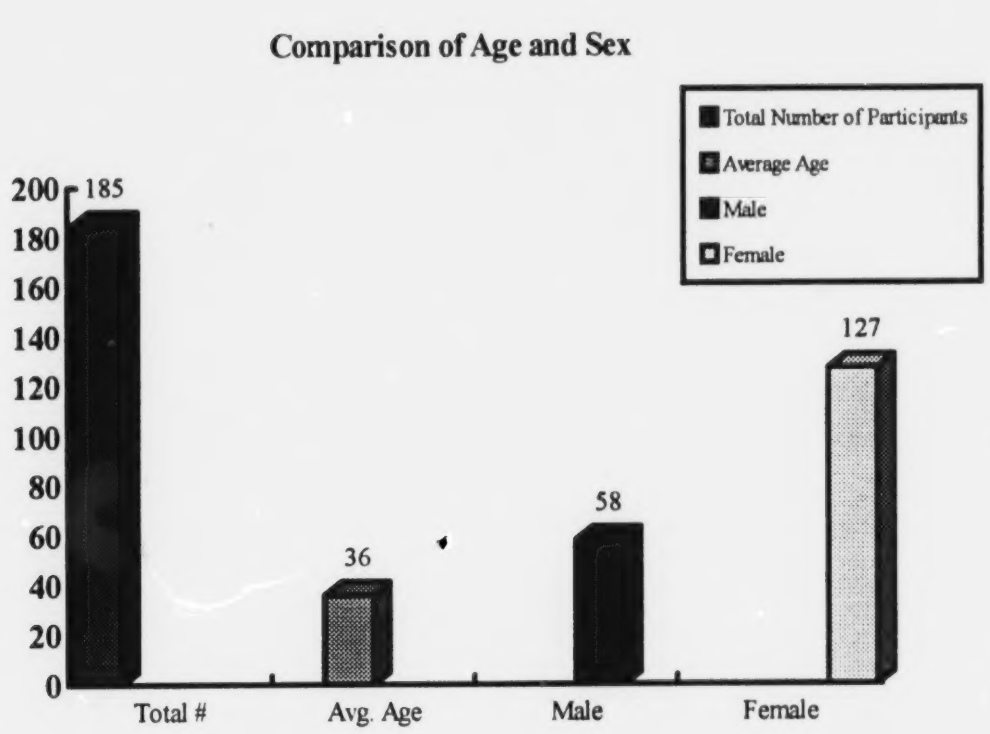
	The Hibbert Group	The Trane Company
Total Number of Participants	185	305
Total Number of Course Hours	5,578	12,106
Male	58	214
Female	127	91
Average Age	36	39
Race		
Caucasian	126	153
Afro-American	40	69
Hispanic	10	57
Asian	0	4
Other/No Response	9	22
Number of Years with Company		
1 - 6	31	31
7 - 10	35	35
11 - 15	31	31
16+	47	47
No response	41	161
Primary Language Spoken at Home		
English	165	202
Spanish	8	53
Polish	1	30
Japanese/Chinese	0	0
Other/No response	11	17
Education		
Some High School	23	38
Completed High School	52	129

	The Hibbert Group	The Trane Company
Some College	43	53
College Degree	32	17
Other/No response	35	68
Head of Household		
No	125	219
Yes	43	60
No response/other	17	26
TABE SCORES		
Reading - Pre training	8.9	8.5
Reading - Post training	10.0	10.4
Math - Pre-training	5.6	7.7
Math - Post-training	9.6	9.3
Percentage of Increase		
Reading	12%	22%
Math	71%	21%

Comparison by Age and Sex

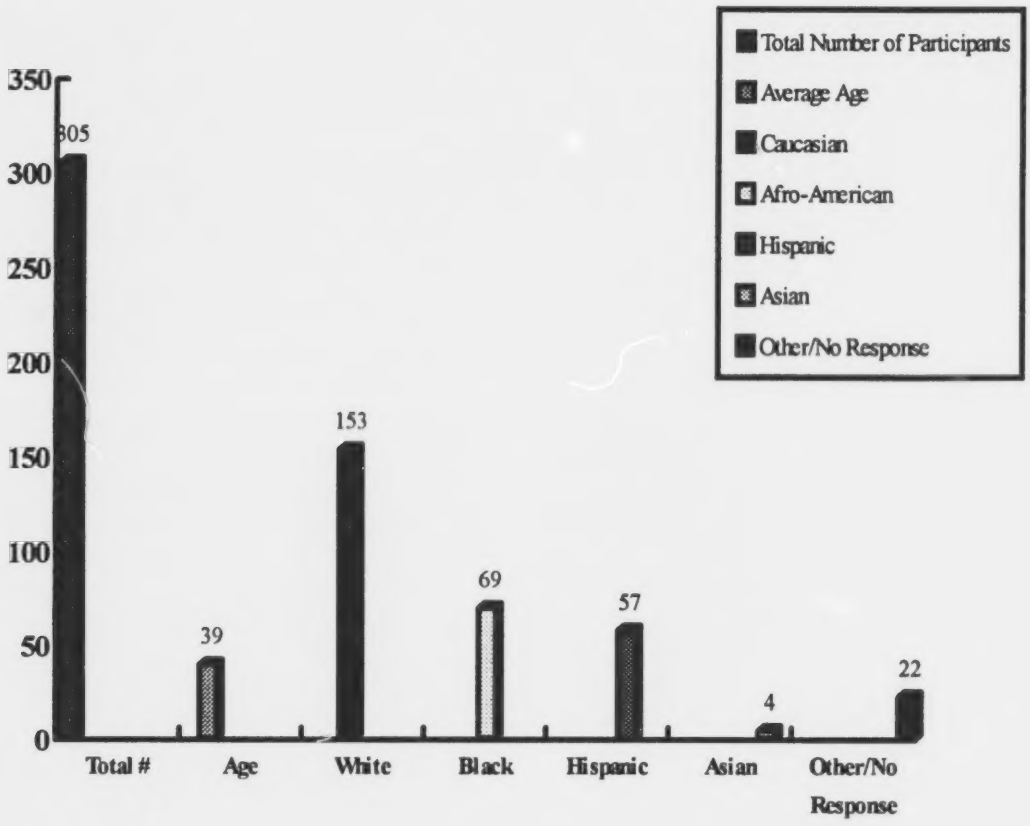


THE TRANE COMPANY



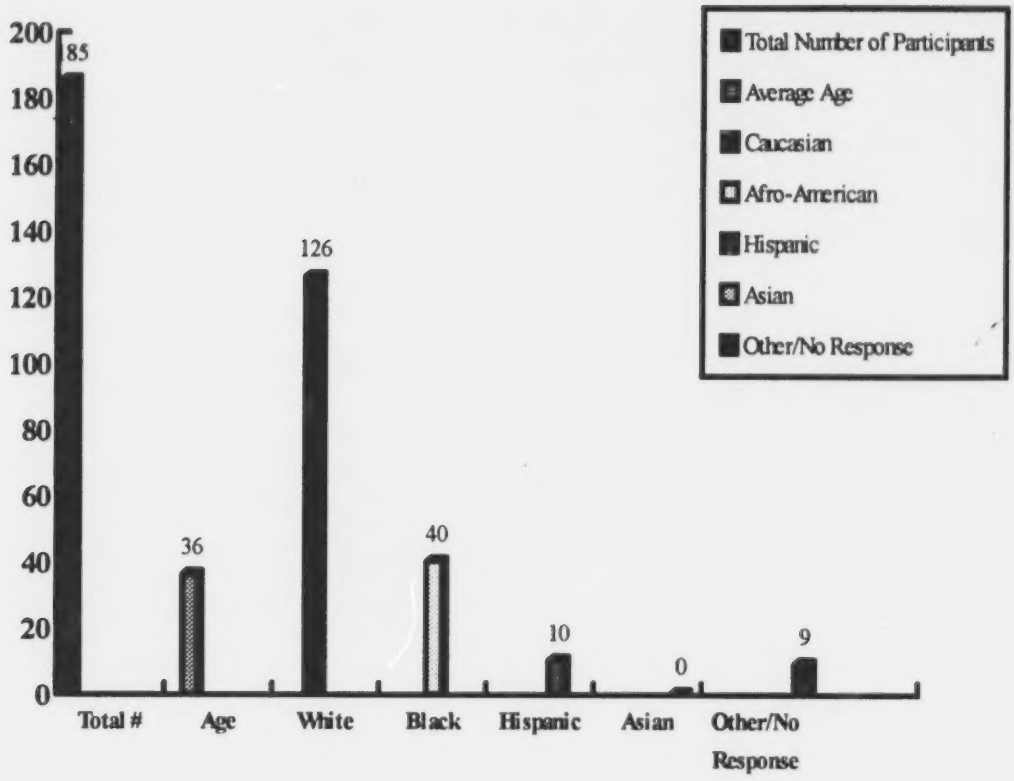
THE HIBBERT GROUP

Comparison by Age and Race



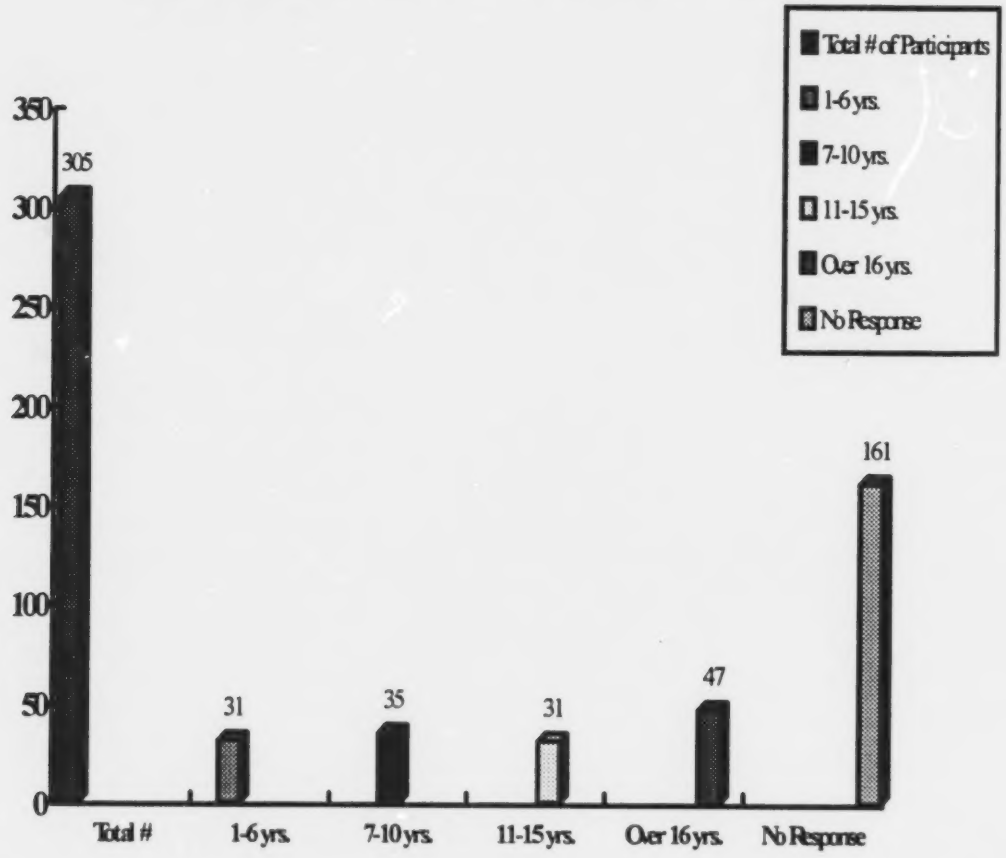
THE TRANE COMPANY

Comparison by Age and Race



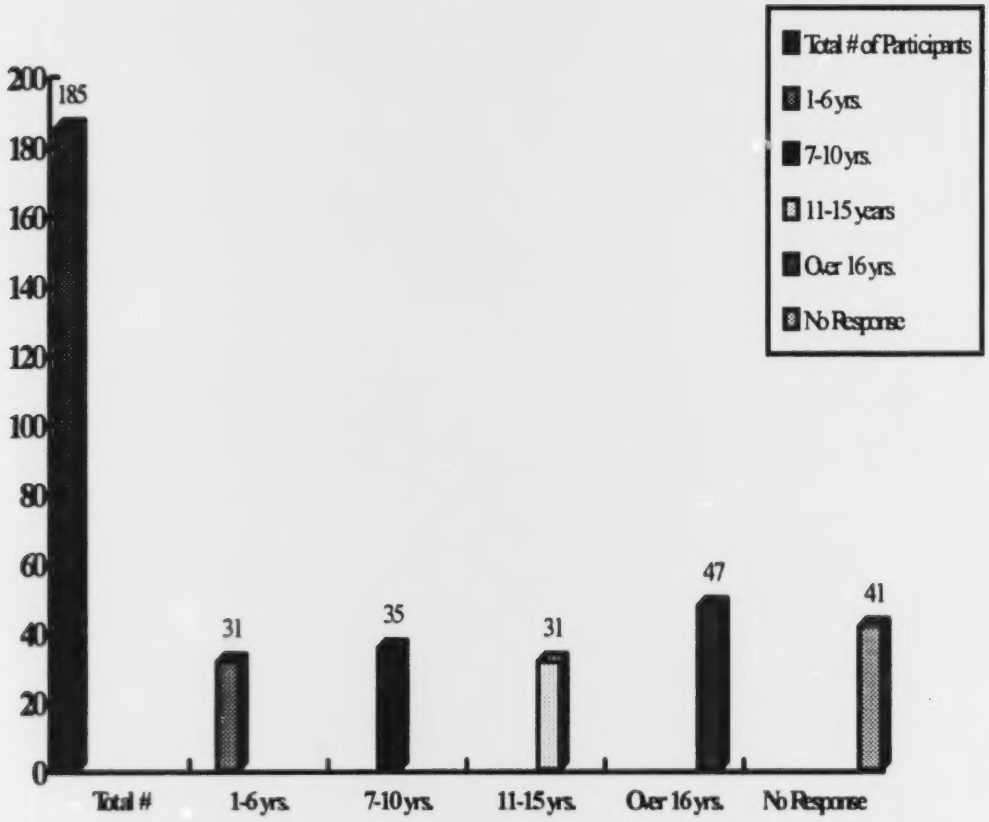
THE HIBBERT GROUP

Comparison by Number of Years with Company



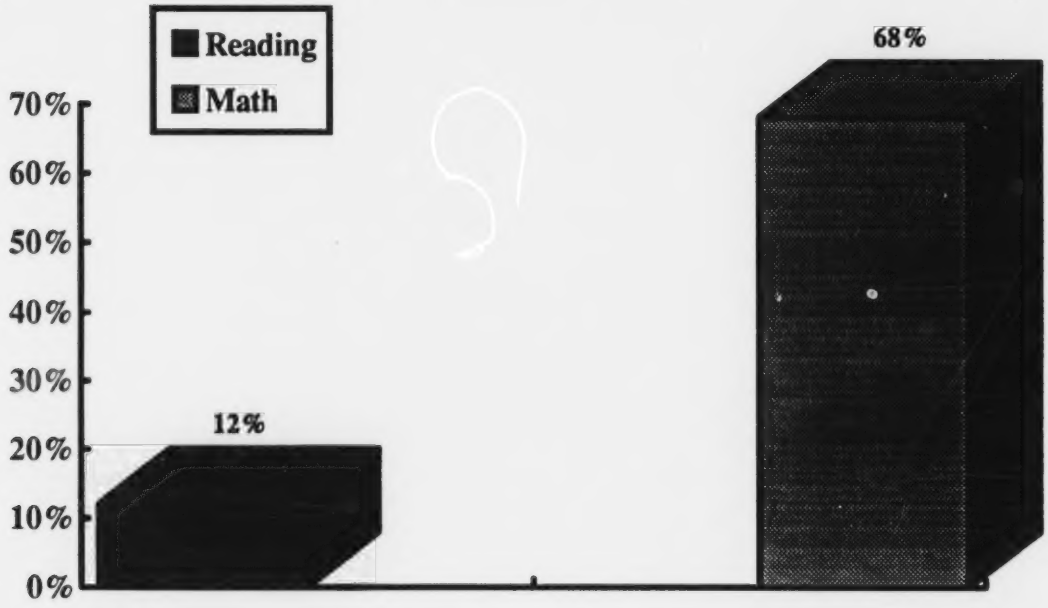
THE TRANE COMPANY

Comparison by Number of Years with Company



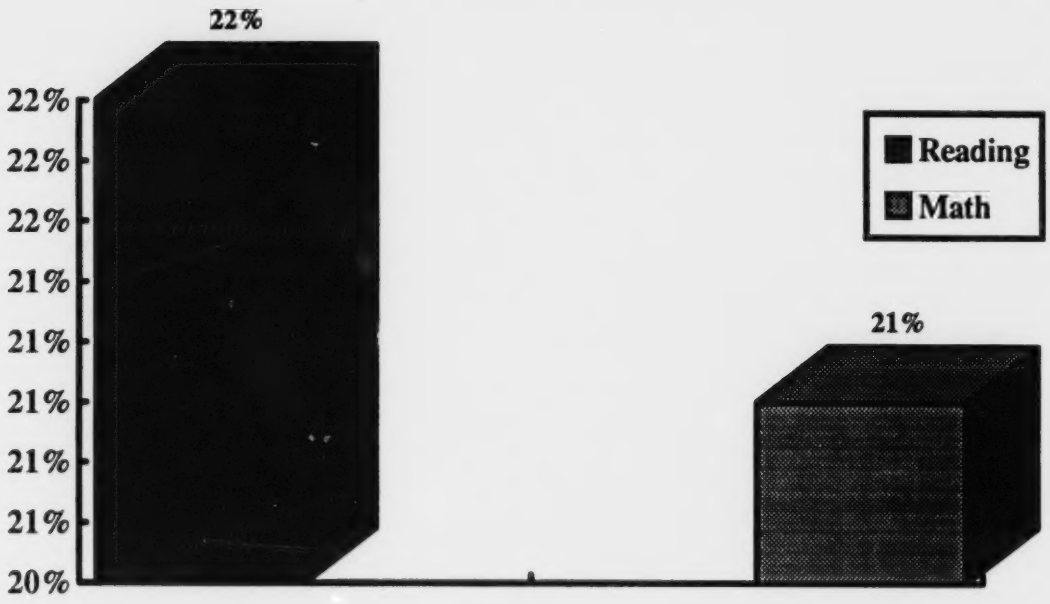
THE HIBBERT GROUP

Comparison by Percentage Increase
Reading/Math



THE HIBBERT GROUP

Comparison by Percentage Increase
Reading/Math



THE TRANE COMPANY

Student Evaluation

After each class, and then by semester, students were asked to evaluate how the program affected their job, homelife, and goals they had set for themselves in the program. At that point modifications were made to ensure a more productive program.

A series of focus groups were held at each company after the program finished. The following are some sample comments from the those sessions.

Focus Group Questions
Students

1. When you heard that there would be training at the company what did you think about the idea?

- Excited
- Curious
- Eager
- Nervous
- I thought it was going to be a waste. Nothing around here continues..it goes for a while then stops, so I thought this would also.
- Surprised that you (Mercer) are still here.
- I was thinking that it would help me fix my English language.
- I thought it would be a lot harder-stricter, more regimented. Surprised by the looseness of the class and liked it. Would choose this type of learning.
- Liked more informal class.

2. What did other people in your area say about the program?

- Questioned how it would benefit them.
- What job advancements they would get?
- No hostility expressed.
- Open arms.

3. Why did you take part in the classes.

- ESL
- Wanted to get freshened up on stuff I forgot about..like in the math...the fractions...I forgot about it. It helped me.
- To see for myself--the teachers were wonderful, we all got along in the group, I enjoyed it.
- I learned a lot. I really enjoyed it. The teachers were excellent. They held my interest.
- It made me want to learn more; I haven't done it yet, but I will.

- I wanted to go on in communication in my reading and writing in English. A lot of things in this country are different than in my country. At first I thought the classes were after work. But when I found out that the company allowed us to take classes during working time period..that surprised me, really. I took it seriously. I found I got more than I was expecting. It helped me a lot in my work because I am dealing with people and in writing.
- I took the class because I couldn't pass the test for a new job. Then I passed the test after the courses.
- I learned a lot. The verbs...and to know each other. When we learned in school we got to know each other.
- I took the math class because I needed to learn math. I was surprised that I struggled with it, but I learned. It helped me with math on my job now.

4. What classes did you take in the program?

- ESL
- Presentation
- Math
- Reading
- Presentation skills, math, reading

6. What were some things that you learned that you now use on your job.

- Blueprint reading...how to identify part numbers and inventory...know proper names
- Numbers
- How to deal with each people in company...different nationalities and supervisors
- Three classes that helped the most (communications, Getting the Point (reading), dealing with stress (workshop). They all dealt with the ways we work here ..the company is like a group..the way we worked together is like the company.

7. What were some things that you learned that helped you at home or in your organizations?

- Being able to speak in a group
- Listening to other people and seeing their point of view
- Became a basketball coach.

8. Was it easy to join the classes?

- Very easy
- No problem

9. Did other people have to work harder for you when you went to classes?

- Often couldn't go because no relief..if absenteeism high

- Only one trained on that job
- Had to work harder when I got back to work
- Sometimes boss wouldn't let me go because there was no relief
- Certain days I had to work harder when I got back to line to make up
- Only 2 people from line could go
- Supervisors let certain people off the line who would be missed the least.

10. What were some good things about the program?

- Kept coming back because of the style of the teachers and because I wanted to learn more.
- The teachers were sincere.
- Not under pressure.
- Surprised that company gave time to go.
- Everything positive came out of the program.
- Got my GED with classes from the program.
- Teachers did an excellent job.
- Workers different nationality, different culture, different levels. Teachers made the class.
- Teachers
- Style of teachers
- Role play, case studies, dialogues, exercises in class
- Not having homework
- Did a whole book while I was on vacation.
- Would enjoy homework on my own.
- Could ask for homework, but not forced to do it. Like having the option.

10. Would you take this program on your own time?

- I would but a lot of people wouldn't because they don't have the time.
- Work nights
- Child care
- Transportation
- Saturday classes might be great...at the company not in the college.

11. What did your kids or grandkids say about you taking the program?

- We have a deal about who is going to finish high school first.
- Proud of me.
- Didn't find it impressive at all.

11. What are some things that you might change?

- Have computer courses-help on the job
- Have all supervisors take courses dealing with people.

- A good spelling course
- Additional writing class just by itself
- Separate grammar and spelling class..in addition to being part of other classes
- Vocational classes so I can be prepared if I ever needed it.
- Business administration classes
- All courses could be longer--wish you could keep the classes going because when you finally got into it the course was over. Especially when I had to miss because of work. Maybe 10 weeks long. Other workers would feel that it was too long, but once they came to class, then it would be all right. But the problem is management letting you go.
- Better relief system so we could get to class more easily
- Some bosses were so supportive that when it was my time to go, my boss comes after me and tells me to go.

12. Would you recommend this program to a friend?

- YES!!
- I have already!

13. What suggestions would you have for other companies to make going to classes easier?

- Better relief schedule

14. If you had the chance to do a training program again would you do it? Why/not?

- Yes
- YES
- Definitely
- More self-confident
- Never too old to learn
- Not afraid to go into classes with younger kids-comfortable in own company.

Instructor Feedback

The staff were surveyed after each session for reactions to activities, suggestions for revisions and additions, ease of using materials/test data with students, and quality and usefulness of faculty development activities. As a result, modifications were frequently made.

Staff Suggestions

The staff comprised following list of suggestions for things that worked best in this program that can be reproduced in other programs.

- Team teaching
- Material that empowered students
- Case studies
- Group work
- Students being able to interact with new/other people from their company
- Students learning in a non-threatening environment at the company
- Class as support system for learning new concepts
- Problem solving techniques
- Students learning how to learn
- Students learning how to handle themselves/others in difficult work situations
- Hands-on activities
- Positive teacher/student relationships
- Using video/tape recorders and actual materials from the floor for lessons
- Mixing people in classes from different work areas
- News for You newspaper (New Readers Press) for supplemental, current, low level reading material
- Word of mouth endorsements from the students that promoted the classes to other workers

Company Comments

The management of the companies also participated in impact surveys throughout the program to gain an understanding about the progress of activities and the benefit to their institutions. These impact surveys contained specific questions geared to understanding the impact of training on each of the individual partners, individual participants, the results on the job from learning basic skills, the impact on job advancement, job performance, and skill acquisition.

The following are some sample comments from two focus groups with company management.

FOCUS GROUP
Management

1. When you heard that there would be training at the company what did you think about the idea?

- Any training is beneficial..whether in reading, communication, or whatever the case
- I thought for a good percentage of people it would help. I couldn't help think for a small percentage of people that they would use it to get out of work. I couldn't help that the thought crossed my mind.
- Yes, further education for employees who need it and couldn't do it on their own is important..especially if they have no transportation.
- Improved business skills and improved morale.
- A boost to the company by giving to the employees professionally and personally.
- Nice for people with families so they don't have to be away more hours.
- Good--incentive by classes being on site people would take advantage of it.

2. What did other people in your area say about the program?

- Not only taking it to get out of a couple hours of work. Sometimes came back to us to find out about the tools and how to do things.
- What you are teaching is definitely what will be required to take tests to bid up.
- Some people didn't sign up because the work would be backed up and they would have too much work to do when they got back.
- The problem with on-site is that all the pressures of work are still there, and it would be very difficult to do both.

3. What did you think your employees got out of the program?

- One girl came out of her shell-used to be real quiet and reserved.
- There's been several like that. This guy now talks a bluestreak..and about business too.
- We still have others who need to learn.
- ESL classes show direct effect on the floor now, and the math and blueprint will show benefits now and in the future.
- This guy had problems reading, and we have bible study together and I can really notice the improvement in reading. He feels more comfortable reading aloud.
- Certain groups of people used to have a spokesperson for them. Now they speak for themselves. It has helped their self-esteem a great bit.
- Improvement in math...fractions
- English helped
- Most don't deal with writing forms--unemployment maybe!
- One person from my area went the whole time and came back with some good ideas.
- One person was an ideal student --she now organizes her day, writes good memos
- Fewer mistakes with ESL people-communicate with people on the floor--understand each other

- Math-the pickers got helped--now they can figure out the amounts more easily
- Writing-not helped at work because we don't do too much of it now, but helped at home
- Reading helped
- Number discrimination-Meter Machine Operators and Terminals- helped a lot. They used to make 5-6 mistakes a week and now maybe they make one. When they made a mistake someone else was billed. It was a problem. It's better now.
- Time cards still a problem-but the people with the problem didn't take the class.
- Business writing-there's been an improvement for a while. It's lasting.
- Documentation-senior coordinators-really worked well.
- Self-confident

6. How did your employees feel about the classes?

- Made them more self confident
- Enjoyed classes
- A lot depended upon the individual
- Liked it very much-but made no major life changes
- A few people said that they would continue with school.

7. Is the company better or worse for this training?

- How many man-hours? Hard to measure. We don't see the return now, but who can put a value on training?
- When you see something like an individual coming to you with their CEU or hear them read, it's worth it. But dollar wise, it's still hard to know if it is worth it. On the surface it seems good.
- Better-every little bit of learning helps
- They give each other the information-pass it to others who didn't go to classes
- Better communicators

8. If your company could have this training again would you vote for it?

- For
- As painful as it was, probably
- If the employees would come on their own time it would be better for the company.
- Other commitments would not let them.

9. What suggestions would you have for other companies to make going to classes easier?

- More replacements
- More trained people
- Replacements don't always worked-either lost time, or you have to do it. By the time you trained someone, the person would be back.
- Same replacement for the same job...but too difficult to schedule

- Absenteeism the problem
- Daily rate versus getting the person to class--it's tough to feel that education is a higher priority than daily rate. We have to have a mindset. If the plant manager feels that the daily rate is number 3, why do we feel that the classes should go behind the rate.
- Close the whole line 2 hours twice a week, plan it, and not need replacements. But can't do it because of large classes, and people keep changing line. Teach 4 classes at once, shut the line so everyone go to classes.
- Mandatory classes versus voluntary-if person refuses to go to classes use them to clean or do other things.
- Employee/employer share time
- Spread schedule over longer time

10. Is voluntary better or worse than mandatory?

- It would help our schedule, but you wouldn't get the participation
- People fear for their job
- Who are you to say that I need training in English?
- Can make them valuable participants. I've seen people not want to be there but you can turn them around.
- I have no problem with mandatory.
- We couldn't force some people to take learning classes.
- Where do you draw the line..everything's mandatory now.
- Two ways to improve your workforce--inside and from outside.

11. If you had the chance to do a training program would you do it? Why/not?

- Yes, with schedule changes.
- Timing of classes changed, then yes.

12. If another company were offered this program, would you vote for it or against it?

- For it
- For it
- Get more valuable employees
- More self-esteem
- If execution of classes could be easier as far as relief of line, then yes.

VII. Summative Evaluation Outcomes

Goal and Objective Accomplishment

Goal 1: Assess the workplace literacy needs of employees targeted for intervention at Trane and Hibbert

In cooperation with the Human Resource Management of each company, supervisors, and representatives, we conducted a needs assessment to: a) determine the kinds of literacy tasks workers were asked to perform on the job, b) assessed the educational level and communication and language proficiency of the workers, and c) identified the gaps between literacy demands and literacy skills.

Objective 1.1: Review the results of preliminary needs assessment conducted at each of the businesses.

At each site, the results of the needs assessment were reviewed with management.

Objective 1.2: Conduct literacy audit of targeted jobs

With permission of the management, we observed workers on the job and collected literacy samples in order to identify literacy tasks, language interactions and document workers' need to read, write and communicate to fulfill job requirements. The audit sought to determine the kinds of print materials used, the tasks performed with those materials, and the types of written and oral communication required.

Language and literacy samples were documented and examples of print materials were collected so that all tasks could be analyzed, assessed, and categorized for the DACUM workshop.

Objective 1.3: Analyze content information and difficulty levels.

The literacy tasks documented and collected were analyzed and classified according to the content knowledge necessary to understand or express the necessary information. We assessed vocabulary, technical terms, jargon, and assumed background knowledge. We evaluated the

difficulty of the sentence structure and the relative clarity of expressions, style and format that the employees used. We also assessed the level of math ability required to fulfill each task successfully.

Objective 1.4: Conduct preliminary analysis of language proficiency, literacy levels, and educational backgrounds of selected workers.

In addition to assessing literacy tasks and print materials, we determined the general level of language proficiency and literacy skills that workers possessed (especially for workers who did not have English as their native language). We interviewed supervisors and, where possible, talked to workers themselves to see how comfortably workers used language and print. We also attempted to obtain information on the past school experience of the workers.

Information from the needs assessment was used to adjust the curriculum so that we could develop the kinds of literacy activities and instructional programs that best met the needs of the Trane and Hibbert workers.

Objective 1.5: Conduct support services needs assessment.

Workers were interviewed to determine the essential support services required to assist them in retention and achieving success in the program.

Objective 1.6: Administer assessment instruments to a sample of workers in targeted jobs for norming purposes.

This was accomplished at both sites.

Objective 1.7: Complete analysis of all assessment information.

This was accomplished at both sites.

Goal 2: To develop instructional materials for adult literacy

Based on information from the needs assessment, we implemented a comprehensive program design and developed the integrated literacy curriculum outlined in the Appendix.

Objective 2.1: Conduct DACUM sessions at each job site for each of the targeted job categories.

Utilizing the needs assessment data, the DACUM process was conducted at each job site for assemblers, production and office/clerical jobs. Employees currently in the job and selected supervisors comprised the DACUM panel and a list of necessary skills for each job was completed on a DACUM chart used to develop curricula.

Objective 2.2: Develop program components

We developed a program consisting of core classes at various levels of literacy, individual tutorial support, and workshop sessions.

Objective 2.3: Develop course curricula for core classes.

Core classes were built around levels of cognitive and processing skills. The development of reading and math skills, strategies for processing print materials, and interpretation of charts and graphs were provided for in each level of literacy training.

Instruction emphasized the acquisition of basic skills and literacy, and developed content knowledge through interactive student-centered activities that focused on actual literacy tasks. Instructors also worked closely with the counselor to help identify students at risk of dropping out. We developed several levels of courses. Individual course levels were adjusted according to actual literacy levels of the class. Actual course content was adjusted to include information from the literacy audit.

During the first three months of the project, a recruiting and assessment procedure was developed by the planning team. Employees were informed of the program and those interested were scheduled for intake interviews. The TABE test (Test of Adult Basic Skills) or the Morano Test was given if the person could not read English in order to determine the employee's level of competency in English. Additionally, an informal assessment survey was designed to determine the employee's educational history, educational goals, and support services needed, and was used to determine placement in entry, intermediate, or advanced levels of instruction. Entry level employees were able to begin instruction during the fourth month of the project, intermediate level participants began in the eighth month, advanced level in the eleventh month. Recruitment and assessment was ongoing throughout the grant to enable employees to continuously enroll in the project. However, although class size was limited to 12 per level, and the companies had difficulty releasing more than 7 to 10 per class.

Core courses were developed in:

- English as a Second Language I, II
- Reading courses including:
    - Reading Lab (below 4th grade)
    - Reading and Writing I, II, and III
    - Presentation Skills (highest level reading/writing)
    - Communicating in the Workplace
- Writing courses including:
    - Business Writing
    - Making the Point
    - Documentation Writing
- Math courses including
    - Math Lab
    - Pre-blueprint math
    - Basic Blueprint Reading (reading tools/measuring part specifications)

- Interpersonal Skills
    - •Stress Management
    - •Problem Solving
    - •Time Management

Objective 2.4: Develop personal awareness workshops. Personal awareness workshops will be developed in the areas of:

- Self discovery
- Goal setting and time management
- Self esteem and confidence building
- Assertiveness training
- Stress management
- Problem solving
- Other educational opportunities

Each of the personal development workshops related to literacy and language acquisition as its focal point with lessons developed by the guidance specialist. Relevant workplace applications were incorporated into the workshops as appropriate.

Objective 2.5: Develop material for small group workshop sessions.

Completed and incorporated this into the program.

Goal 3: Develop program orientation for workers.

To allow for maximum access to the program by these workers, we developed a program that was as "user friendly" as possible. The orientation program provided information, dispelled fear,

and promoted participation. To reduce the fear factor even further, we encouraged workers to meet individually with the counselor and teachers who were assigned to their work site.

Objective 3.1: Disseminate information to the workforce.

With the support of Trane and Hibbert management, a workplace team visited the work site to talk to supervisors and interested workers. They introduced the program, disseminated flyers and posters, and were available to answer questions.

Objective 3.2: Provide Orientation Sessions

Orientation sessions consisted of "user friendly" question/answer sessions with interested workers. Sample formats of classroom content, scope and sequence of program and program participant advantages were illustrated. Ample opportunity for question/answers and peer interaction allowed the participants to join the program with realistic goals and a positive attitude.

Goal 4: Conduct orientation sessions for faculty and staff.

Objective 4.1: Conduct pre-service training to familiarize faculty and staff with final program schedules, needs assessment results, and curricular development activity.

Accomplished. See Section V for Staff Development.

Goal 5: To provide academic counseling sessions with each participant selected for the program to develop and individualized educational plan.

Accomplished. See Section IV for counselor activities.

Objective 5.1: To provide academic counseling for participants so that individual educational goals and plans of action are developed in order to retain at least sixty percent of students in the program and provide guidance for continued educational and

career advancement.

Each employee seeking enrollment in the program participated in an in-take interview with the guidance specialist. The interview resulted in a discussion about courses available for the individual and the development of an IEP which outlined educational goals. In addition, the counselor provided referral information for employees who needed other educational programs such as a GED. Depending on the work cycle at the company, there was an average of 78% retention rate at Trane and 71% at Hibbert.

Goal 6: Implement instruction.

The first three months of the 18 month program were used to develop curricula and complete the assessment phases of the project. The remaining 15 months were used to implement instruction, evaluate the project and disseminate project results.

Objective 6.1: Conduct open-ended training cycles of 15 month duration training cycles providing instruction to 600 workers; retain 240 workers through completion of class and move at least 60% of the workers at each site to the next level of instruction.

During each of the 5 training cycles there were two sessions offered, allowing employees easy access into the classes. There was a range of 71 to 86% retention rate for the sessions depending upon the business cycle of the companies. We trained a total number of 490 employees out of the expected goal of 600. This was caused by two factors: 1) adverse business conditions at Trane causing layoffs, and 2) Hibbert had fewer employees at the start of the grant than anticipated (only 300 employees, instead of 900 anticipated), and only 250 of them were eligible for the program.

Goal 7: Develop participant skill and workplace literacy.

Objective 7.1: Increase workplace literacy performance as measured by test scores, levels of workplace literacy participation and feedback from supervisors.

See Section VII. Performance Outcomes

Goal 8: Institutionalize the program

Objective 8.1: The college will incorporate the introductory classes into the college's curricular offerings for business and industry. The introductory class that integrates reading, math and, where applicable computer literacy in a workplace context, will be refined and made available to any industry in the area needing to provide that kind of course to their employees.

The college has included the math, pre-blueprint math, and workplace ESL into their offerings for non-credit education. In addition, a marketing brochure was developed that provided county business with information about access to some or all workplace education.

Objective 8.2: The organizations will provide on-going training for their employees through partnership with Mercer County Community College and other educational and community agencies addressing the literacy problem.

At present, both companies will continue to use the services of the college to train their employees with workplace basic education.

Goal 9: Disseminate the results.

Objective 9.1: The college will make conference presentations on the project.

The college participated in numerous conferences to disseminate information about the program. See Section IX.

Objective 9.2: The organizations will publicize project efforts among other employers.

Both companies have promoted the program both formally and informally to other businesses in the area.

External Evaluation

The following report is an evaluation of the program by Philip M. Ringle, Ph.D., who was responsible for the external evaluation of the program.

Philip M. Ringle, Ph.D.
10217 Tuscany Road
Ellicott City, Maryland 21042

Phone (410) 465-6734

Ms. Elaine S. Weinberg
Project Director
Workplace Skills Project
Mercer County Community College
1200 Old Trenton Road
Trenton, New Jersey 08690

February 8, 1994

Dear Elaine,

It has again been my pleasure to serve as the external evaluator for the Workplace Literacy Grant at Mercer County Community College. The grant program has indeed lived up to the expectations outlined in the original proposal and more importantly has touched the lives of each of the program participants in profound ways. Those individuals, the college and the community have benefited as a result of the program. You, your staff and your business partners should be extremely proud of what you have accomplished and the model you have instituted.

I have enclosed my final invoice and the final evaluation report. If there are any questions please feel free to contact my office. As you know, I have been involved in writing and evaluating grants for many years. I can honestly say that over those years, few programs have been initiated, implemented and carried out as well as the Mercer project. Thank you again for your cooperation in the external evaluation and accept my best wishes for the successful continuation of the college's workplace literacy efforts.

Sincerely,

Philip M. Ringle, Ph.D.

Mercer County Community College

Workplace Literacy Grant - External Evaluation

Final Report

Prepared by:
Philip M. Ringle, Ph.D.
February 8, 1994

The final external evaluation was designed to document accomplishment of project objectives and achievement of projected outcomes. More specifically, the evaluation focuses on documenting the activity proposed in the original application. To accomplish that task, the following areas were reviewed:

- Project Administration;
- Provision of Program to Satisfy the Needs Assessment;
- Development of Curricula, Materials and Courses to Address the Literacy Audit;
- Partner Involvement;
- Recruitment and Orientation Activities;
- Student Success;
- Evaluation;
- Budget Management; and
- Dissemination and Replicability.

Project Administration

The program was developed, implemented and initiated as outlined in the proposal with no substantial changes. Each objective was acted upon as described in the initial grant application and all project goals were addressed. Careful attention was paid to all activities and they were implemented as planned. The administrative needs of the program were carefully considered to provide sufficient support for staff and students. Clearly written job descriptions were developed for all positions. Affirmative action guidelines governed the hiring of all employees for the program. Ms. Weinberg has worked closely with college personnel to ensure that project administration met the requirements of the federally funded project and the practices and procedures of the college. The program secretary kept careful records in files and on disk.

Project timelines and the milestones have each been met within the timeframe proposed. In at least one instance the timelines and milestones were improved by creating two mini-mesters.

Faculty were involved in curriculum and staff development. Faculty orientation and training were especially strong aspects of the program. New faculty were provided with an orientation to the program. They also participated in a "train the trainer" workshop. Faculty were helped in making the transition from more traditional adult education settings to the workplace. Weekly staff meetings

were held to supplement training. These meetings provided essential faculty reaction to problems, concerns, and questions that arose naturally in the program. Staff development activities were well planned and extensive to ensure a thorough understanding of the unique nature of the program. All materials and supplies were available and equipment was accessible to faculty and staff. Staff evaluation was ongoing. As a result of performance evaluation, one faculty member was dismissed.

Provision of Program to Satisfy the Needs Assessment

An individual education plan (IEP) was developed for each participant as part of the advisement and orientation process. Monitoring the IEP was ongoing and conducted through counselor tracking and teacher information.

The IEP was targeted to the workplace program at each site. The content of the IEP was adequate to both individualize the program needs of participants and to periodically monitor participant progress.

Development of Curricula, Materials and Courses to Address the Literacy Audit

Curriculum development was based on the DACUM model and the DELTA process to interpret DACUM results. College staff worked closely with supervisors at both TRANE and Hibbert to design relevant curricula. The DACUM process utilized key employees and supervisors as panel members. I reviewed the DACUM materials developed for Data Services, Inventory Control, Planning and Quality Assurance at Hibbert and Assembler Operators at TRANE. Materials were complete and comprehensive. The DACUM process appeared to have been especially successful in this project. The director reported that the DACUM charts provided a template for curriculum development and skills identified could be used as a text for lesson plan development. I believe that curriculum development work that has occurred is an exceptionally strong component of the Mercer program. Curriculum development is ongoing and faculty are committed to producing the highest quality curriculum for each program participant.

Materials developed suggested a high level of professionalism and attention to detail. Materials developed to date included:

- curriculum guides for course offerings;
- IEPs,
- DACUM charts,
- resource materials
- etc.

Resource materials were plentiful and faculty sampled a variety of books and software. Written curricula were developed for all courses offered. The unifying theme across all of the curricula was

the practical application of workplace materials used in the classroom. I examined sample curriculum guides. Beyond the utility of those guides in the current project, I believe they would be extremely useful to other programs. During the final site visit I had the opportunity to observe a class in pre-blueprint math. I also reviewed the teacher's manual for that course. The materials and design are comprehensive and consistent with skills required for advancement or retaining a position at TRANE. Instructional techniques employed were appropriate to the learner and the learners were actively engaged in the learning activity. The instructor answered all questions and reviewed and repeated material when necessary.

The college has developed a wide array of courses to satisfy the workplace training needs of both employers and the skill development needs of program participants. The following courses and workshops were offered throughout the grant period.

Reading and Writing
Mini-Grammar Modules
English as a Second Language
Business Writing
Math Lab
Math on the Job
Documentation and Technical Writing
Economics
Basic Reading
Stress Workshops
Time Management
Problem Solving
Pre Blueprint Math
Blueprint Reading

Each course offered has been documented. Classes were available for all levels of learners.

Partner Involvement

The project director has established positive relationships with staff in each partner corporation. Learning about the partners and their values and expectations helped to promote a program sensitive to the needs of the diverse cultures both within the conference room and the classroom.

The partners each have met their pledged share of program responsibilities. Each partner has provided employees with ample time for the program and information about the program. They also have supported the program by providing the promised space, equipment and access to the workforce. Training facilities were clean and adequate in both locations. All of the partners merit commendation.

Recruitment and Orientation Activities

Publicity about the program was achieved through many activities. The primary vehicle for recruitment was the orientation meeting. Twenty-eight orientation sessions at TRANE and fifteen at Hibbert were followed by individual counseling and advisement. All program staff contributed to the orientation and recruitment process. Buttons, promotional materials, the creation of a brochure, briefings to workers and recognition ceremonies all advanced the program.

Student Success

Enrollment in the program fell short of the projected enrollment. The program will enroll over 450 students, but less than the 500 anticipated. The major reason for the shortfall was the data provided by one partner before the program. Hibbert stated that they had 900 employees and the program could anticipate about 300 being eligible. In reality, while Hibbert had 900 employees nationwide, only 200 were employed at the Trenton site. Of those 200, 172 were eligible so the enrollment was closer to the grant proposal projection than it might have been. The good enrollment results stem from the strong and coordinated recruiting effort undertaken.

Mercer's workplace literacy program offered 1013 sections of courses during the grant period. Retention for the program period was 78% of students at TRANE and 71% at Hibbert. The retention data underscores the relationship between business cycles and workplace literacy programs. Employers pulled employees out of courses during both periods of high and low business activity. In fact, business cycles could be traced by following retention of students. The variation at Hibbert for instance ranged from a high of 82% in one cycle to a low of 52% during a period when business productivity peaked. Pre-Post test results in individual courses all showed progress with students achieving an average increase of twenty points.

Evaluation

A most improved area of the grant was the attention to evaluation and the desire of the staff to validate the results of their work. The project employed seven evaluation strategies. In addition to this evaluation, an external evaluation of program outcomes was contracted to Princeton University's Woodrow Wilson School of Economics. Absenteeism, job promotion, change in pay and awards are being studied. Preliminary results suggest statistical significance in the number of company awards and recognition won by participants in the literacy project when compared to their non-participating peers. Princeton has also prepared a research survey for the program.

Beyond the external evaluation, the project has employed pre and post tests in each course, pre and post TABE testing, supervisor feedback and focus groups of employees, managers, and employees not enrolled. Supervisor reactions have been sought informally and through paper and pencil evaluation surveys. The college has established the necessary record keeping and management controls to ensure that the evaluation is accurately conducted. I had an opportunity to review evaluation system design and application and believe that the methodologies will yield valid and reliable data. Appropriate pre-tests, documentation, and records have been kept.

Budget Management

College officials have instituted required fund accounting procedures. Administrative systems for purchasing, budget management, and internal fiscal control are appropriate. There was evidence that the materials purchased were high quality and that the efforts of the entire staff were evident in the selection of materials.

Dissemination and Replicability

Not only were all the proposal elements in place, but also many worthwhile components were developed which are by themselves, worthy of dissemination and replication. As the project comes to a close, there is a great deal of evidence to demonstrate that the program will be replicated at Mercer and that the model created will be widely disseminated so that other potential providers can take advantage of the products developed.

Mercer has already replicated courseware, curricula and ideas developed through the workplace literacy project. Courses and concepts have been integrated into other areas of credit and non-credit instruction. The college is beginning to certify worker skills in other companies and both of the current partners have indicated a desire to continue the program after the funding period. The director has been extremely active in disseminating program specifics and advancing workplace literacy. This has been accomplished through speeches at conferences, television appearances, and articles.

Conclusions and Recommendations

While maintaining my objectivity as an external evaluator, I was extraordinarily impressed with the program and am hard pressed to offer any substantive recommendations for improvement. The result of this grant has been what I believe to be an exemplary model of workplace learning.

The relationship with each of the business partners has been excellent, the teaching/learning process and what is happening in the classrooms is outstanding, and all of the evaluation

methodologies underscore the success of the program.

PRINCETON UNIVERSITY

STUDY ON EFFECTS OF WORKPLACE EDUCATION

MAY, 1994

New Evidence on Workplace Education

Executive Summary

This paper presents an analysis of the impact of a workplace education program that was administered by a community college at two companies. One of the companies studied is in the manufacturing sector and the other is in the service sector. The statistical analysis relies on longitudinal administrative data and cross-sectional survey data. Major findings include the following:

• At both companies, workers who participate in the training program tend to be younger, lower-paid, more likely to be female, more highly educated, and more recently hired than nonparticipants.

• At the manufacturing company, workers who participated in training tend to have about 0.4 percent higher wage growth than nonparticipants following the training period. This finding holds up even after holding constant the effect of job tenure, gender, age, and other factors. Moreover, the statistical precision of the effect of training on wages is such that it is unlikely to have occurred by chance. The results are strongest for occupational-based courses.

• At the service company, participation in training has not had a statistically discernable effect on employees' wages.

• At the manufacturing company, participation in job training has a strong, positive association with subsequent job bids and upgrades. This effect seems particularly strong for occupational-based training. Unfortunately, we have not been able to study job bids or upgrades in the service company.

• At the service company, training is associated with increased incidence of performance awards and nominations, although in some of our estimates we cannot reject a chance association.

• Job training is positively associated with self-reported performance appraisals at the service company. For example, workers who participated in training are much more likely to report that they feel their supervisor would say they make fewer errors and are doing a better job than a year ago. We do not find a statistically discernable relationship between training and these subjective measures at the manufacturing company. At both companies, however, participants are more likely to say they plan to take additional training courses than nonparticipants.

• The total cost of the training program (including direct expenses and foregone work) is estimated at 4 percent of the average worker's yearly pay. If the training program produces an annual social benefit of just 0.275 percent of the average worker's pay for 20 years, the program's benefits would equal its costs in present value.

New Evidence on Workplace Education

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May 11, 1994

We are grateful to the two companies and the community college that graciously provided us with data and patiently answered numerous questions. We are also indebted to the workers of the two companies who filled out our questionnaires. We are grateful to Herb Abelson, Kevin Hallock, Dean Hyslop, Lisa Krueger, Mark Lopez, Jonathan Orszag, Paul Oyer, Jin Park John Penrod, Xu Zhang, and especially Kim Neuman for excellent research assistance. Seminar participants at the University of Texas at Austin and Carnegie-Mellon provided valuable comments. We thank the Center for Economic Policy Studies at Princeton University for financial support. Unfortunately, the data used in this paper are confidential and may not be made available to other researchers.

ABSTRACT

This paper presents an analysis of the impact of a workplace education program that was administered by a community college at two companies. One of the companies we study is in the manufacturing sector and the other is in the service sector. The analysis relies on longitudinal administrative data and cross-sectional survey data. We examine a broad range of outcome variables, including workers' earnings, performance awards, and subjective performance measures. Our main finding is that the program had a small, positive impact on earnings at the manufacturing company, but an insignificant impact at the service company. We also find that the training program had a positive association with the incidence of job bids, upgrades, and performance awards. At the manufacturing company, occupational courses, such as blue print reading, had the largest impact.

Although an extensive literature exists on the effectiveness of public sector job training, a much smaller literature exists on the impact of private sector job training on workers' wages, productivity and other employment outcomes. Heckman, *et. al.* (1993) attribute this difference to a lack of data and a greater ease in receiving funds for studies of public sector training. Nevertheless, several recent policy pronouncements call for the encouragement of more private sector training in the hope that training provided directly by employers will be effective. As an example, Burtless (1993) advocates a payroll tax to finance such training. Public policy regarding private sector training would be on much firmer ground if more were known about the return to investments in workplace training.

Most studies of public sector training generally find positive returns for female workers, but small and some times negative returns for male workers and youths (see LaLonde (1993) for a survey). On the other hand, the existing literature on private sector job training generally finds that such training programs have a positive effect on labor productivity. Bartel (1991) and Holzer, *et. al.* (1993) conclude that employer training increases labor productivity at the firm level. Using individual level data, Brown (1989), who uses the Panel Study of Income Dynamics, and Lillard and Tan (1986) and Bishop (1990), who use the Employment Opportunities Pilot Projects Surveys (EOPP), find that on-the-job training has a positive and significant effect on wages and reduces voluntary turnover. However, these studies rely on responses to questions that combine many diverse training programs, the relationship between the timing of the training and the current job is unclear, and the questions often refer only to entry level jobs. Furthermore, there is potential bias from nonrandom selection into training. Lynch (1992) uses the National Longitudinal Study of Youth (NLSY) and finds that off-job private training appears to increase wages significantly, while the positive effect of on-job training on wages disappears in first-differenced equations that eliminate any permanent individual effect on wages. With all of

these studies, it is unclear whether they provide relevant evidence on the types of private sector training programs currently being advocated.

In this paper, we study the effect of an employer-based education program on a variety of employment outcomes for individual employees. To perform this analysis we conducted a prospective study of a standardized job training program that was offered at two mid-sized companies (250-800 employees) in New Jersey. The workplace education program was administered and designed by a community college, as is common (Bassi (1994)), and subsidized by a grant from the federal government as part of the Workplace Literacy Program. A strength of our analysis is that we use data from administrative company records. We also supplement the company data with survey data that we collected from the employees. Our data set has several advantages over past data sets used to study private sector training. First, the key variable of interest, participation in the company training, is based on administrative records from the community college that organized and designed the training program. Thus, we have detailed information on the program as well as an understanding of the content of the training. Second, we have collected information on a rich set of employment outcomes, including wage growth, performance evaluations, and absenteeism.[1] Finally, the training was focused on low-skilled, hourly workers, who have been most hurt by recent trends in the U.S. wage structure.

The fact that our data represent one training program and come from only two companies has both benefits and limitations. The obvious disadvantage is that our results are not necessarily applicable to other programs or to other companies; this must be kept in mind when considering the results. Another limitation is that the program ended in February, 1994. Thus, at this stage, we are unable to examine potential long-run effects of

[1] As of the writing of this draft we have not completed the analysis on absenteeism.

the training courses. On the other hand, the workers are likely more homogenous than those in national data sets and they face the same local labor market conditions. The estimates also apply to a standardized training program that is of current policy interest.

We find that participants in this training program were on average younger, had less seniority, and were more likely to be non-white and female than non-participants. Further, participants in both companies earned less per hour than comparable non-participants, suggesting negative selection into the program. On the other hand, in the manufacturing company, participants were more likely to have bid for posted jobs before the training started than were seemingly comparable non-participants. Overall, we find small effects of the program on individual outcomes. In the service company, we find no significant effect of the program on wage changes of participants relative to non-participants. We present limited evidence that participants were more likely to be nominated or win a performance award at the service company following training. Average wage growth for trainees in the manufacturing company is larger relative to non-trainees, and the effect is usually statistically significant at the 5% or 10% level. Further, trainees are more likely to bid for new jobs and to receive upgrades than comparable non-trainees. Much, if not all, of the overall increase in wages and job bidding appears to be due to "occupational" courses that provide skills that are valuable for specific jobs at this firm.

I. Background

The training partnership between the companies we study and the community college began when the companies sought help from the college for on-site training for lower skilled workers. The companies believed that their lower skilled workers needed training if the companies were to remain competitive, and yet they did not have the in-house capability to

provide such training. The program was designed by adult education specialists at the community college and subsidized by an 18 month grant from the federal government for $450,000. The grant is part of the federal government's attempt to improve the workplace literacy of currently employed low-skilled workers. The training ran from October/November 1992 through February 1994, and consisted of courses provided on-site by teachers, hired specifically for the program, who specialize in adult education. Classes were held on-site and typically met twice per week for two hours and were taught in five 8-12 week sessions. Employees were paid their regular wages during class time.

Workers voluntarily signed-up for the classes, although they could only participate if their absence would not disrupt the flow of work, as classes met during the regular shifts. In our survey of the service employees, we inquired why they chose to take classes. Eighty percent of those who took at least one class cited a desire to improve or update their skills in general as one of the reasons for taking classes, 15% needed to know more about a particular subject, and 10% sought to learn enough to help their children or grandchildren at home. Only 10% of those taking classes circled "My supervisor made me do it" as one of the reasons. Among those who did not take any classes, just over 40% of those who were employed at the company last year claimed a lack of interest in the classes and only 12% claim to have been unable to "get off of the floor" as reasons for not participating. These results suggest that individuals taking the classes were more motivated than their non-participating co-workers.

A combined total of 480 workers attended the training classes. Eighty percent of the trainees enrolled in 1-3 classes for a total of 5800 hours of class time in the service company and 8400 hours of class time in the manufacturing. Workers in the two companies (combined) attended a total of over 12,500 actual class hours. The companies paid no direct

costs (as the teachers' salaries, course materials, etc. were covered by the federal grant), however the indirect costs were large. In release time alone, the foregone cost of production amounted to almost $150,000. The program director estimates the total indirect cost (which also includes the value of fringe benefits, 15% of the wages for 18 months for the employees of the companies who oversaw the training, and the rental cost of the room) to be about $300,000. Thus, the program cost approximately $940 per student, or $36 per student class hour, and is about equivalent to the cost per trainee for programs sponsored by the Job Partnership Training Act (Bloom, *et. al.* (1993)). The total direct and indirect cost of the training program was about 4 percent of the average employee's compensation.

The content of the training was largely basic skills education that was custom tailored to these specific companies. Subjects ranged from reading, writing, math, and English as a Second Language, to more occupational courses such as blueprint math and blueprint reading. The program also included "mini" classes in subjects such as communication, stress reduction, and time management. Because the classes primarily taught general skills that would enhance productivity at other companies, a basic human capital model would predict that the employees bear the full cost of the classes. Employers would have little or no incentive to pay for the training since employees would have an incentive to leave the company with their new skills. On the one hand, since the employees in this program essentially bore none of the direct cost of the training (class attendance was on "company time") we might expect an increase in worker turnover. On the other hand, the directors of human resources, although aware of the possibility, were not overly concerned about inducing more turnover. In particular, the director at the manufacturing company noted that while skills such as blueprint reading were, in principle, valuable at other firms, the decline in manufacturing in the area reduced the portability of the skills, rendering the training more

"specific" in nature.

In general, it does not appear that training participants had higher turnover in the months since the training began. In fact, at the manufacturing company 21% of those workers who were present just before the training started had left 18 months later; the comparable percentage is 18% among trainees. At the service company, only 10% of those workers who were present just before the training started had left 18 months later, and the turnover rate is roughly similar among both trainees and non-trainees. In the short run, based on these statistics, the training does not appear to have caused disproportionate turnover among the participants.[2]

II. Data

The Manufacturing Company

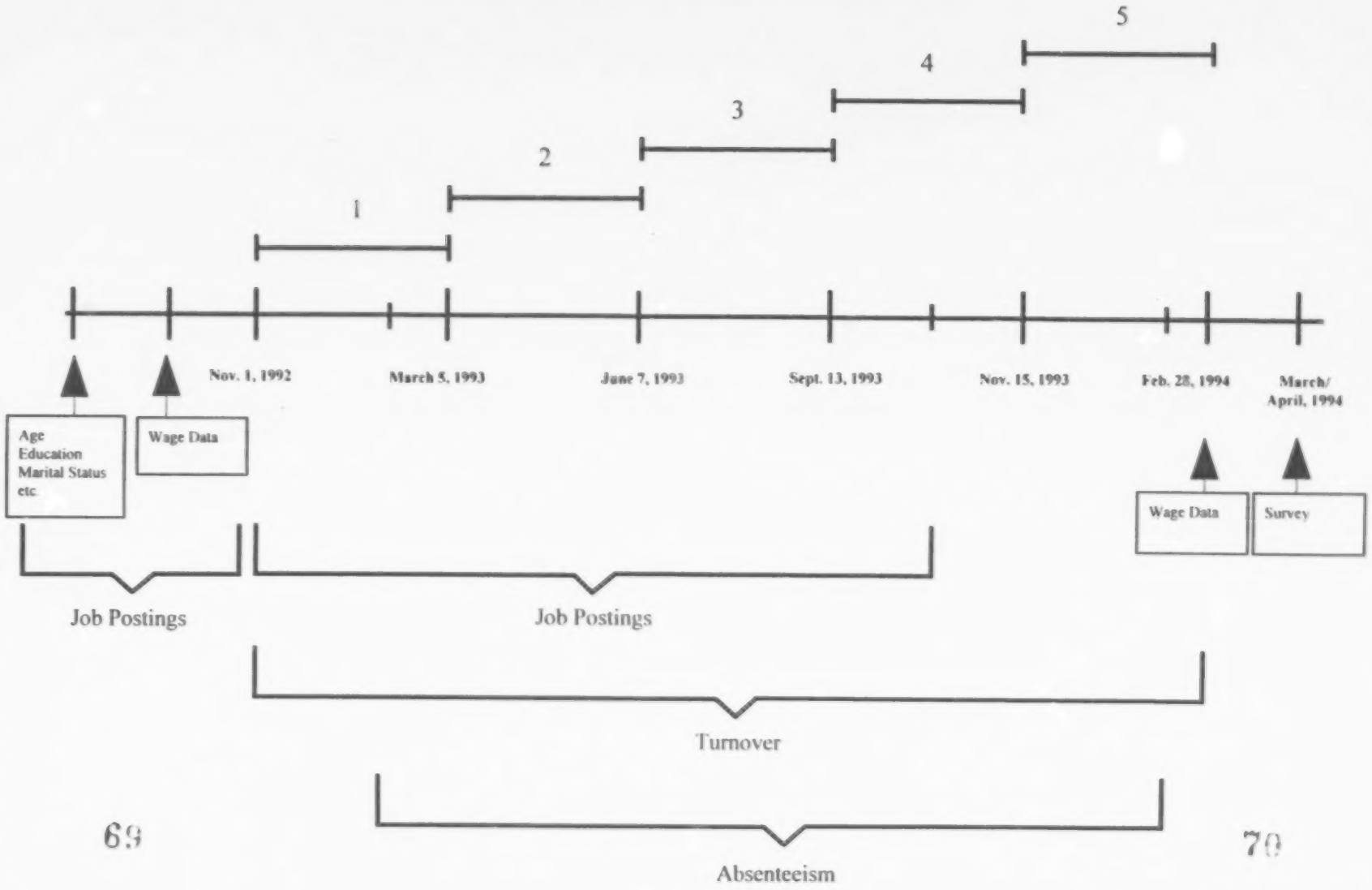
Employment at the manufacturing company is highly cyclical, fluctuating between 500 and 700 production workers. All production workers were targeted for training. From job applications, we collected information on age, education, race, date of hire, and marital status. In addition, we recorded all jobs each employee had held while employed at the company. We have detailed information through November, 1993 and the company provided us with an update on the jobs held by employees as of February 1, 1994. Because the classes were held over five sessions and our data come from different sources, we present the timing of various outcome measures in relation to the training program in Figure 1a.

Our first outcome measure is hourly wages. We recorded previous wage and job

[2] In the manufacturing company, 70% of those who left did so because of "personal illness". Only about 3% left due to "another job", "moved to another area", or were "absent for more than two weeks". Neither of these categories contain disproportionate shares of training participants. On the other hand, approximately 20% were laid-off or discharged (27 workers) of which only 3 had participated in training.

Figure 1a

Manufacturing Company



profiles within the company from the personnel files. The classes at the manufacturing company started in early November, 1992 and ended in February, 1994. Thus, we collected information on the wage in effect as of October, 1992 as a measure of the pre-training wage. Note that since the company is unionized, wage rates are attached to jobs. In some specifications we also include the wage in effect in July, 1991 to capture differential wage growth over the wage distribution. As stipulated by the union contract, job openings are posted and workers bid for them. The most senior qualified worker receives the job upgrade. Thus, another outcome we consider is the number of jobs for which an employee bids as well as the number of job upgrades received. Workers who receive training may bid for more jobs either due to increased skills that allow them to qualify for higher skilled jobs or because they perceive they are more qualified. Either way, the company gains by having a larger pool of applicants from which to choose. We collected both the total number of job bids and upgrades received from January 1992 through October 1992, as well as the number of job bids and upgrades received from November 1992 through October 1993. We have the problem that the classes were still being held as of the dates of these outcome measures; however, all of the employees who were enrolled in classes in the fifth session had also taken classes in previous sessions.

We started with a sample of 729 production workers from the manufacturing company. In creating our analysis sample, however, we excluded 168 individuals who were not employed by the company on Feb. 1, 1994. In addition, we excluded 78 employees who were hired after October 31, 1992 (29 of whom left before February, 1994). Finally, we excluded nine apprentices. The apprenticeship program lasts 4 years and during that time, the apprentices are not paid according to the union wage schedule. Thus, our wage results are somewhat sensitive to which wage we assign them because the apprentices receive a large

wage increase upon completion of the program. Given that the apprenticeship is another form of training and that participation in the community college program is unlikely to change the short-term trajectory of their wages, we chose to exclude them.[3] Our final sample from the manufacturing company includes 503 workers.

The Service Company

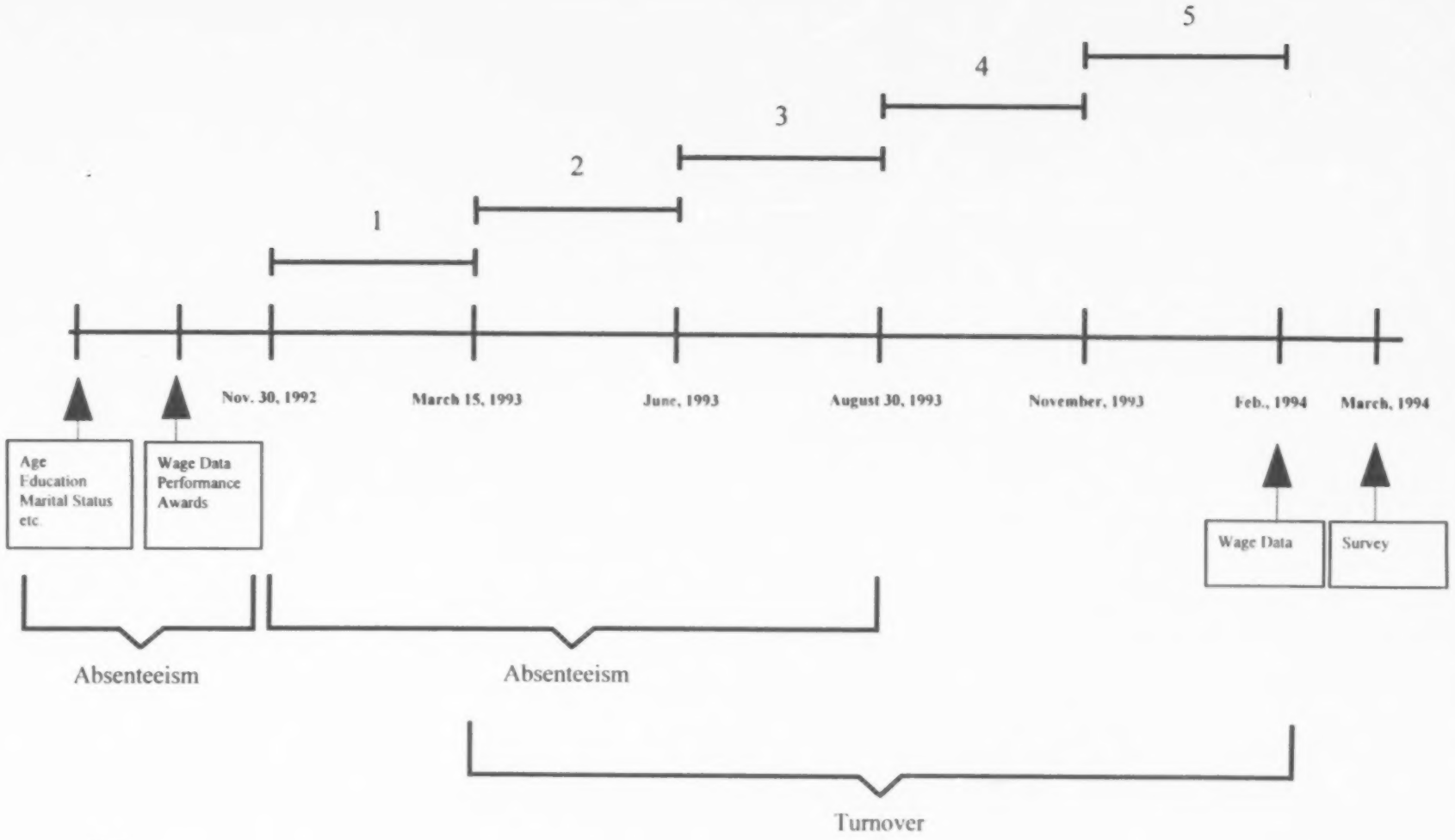
The service company employs approximately 300 workers, of which 250 were targeted for training. We collected information on each worker's age, gender, race, education, marital status and date of hire from their job application forms. See Figure 1b for a time line of the class sessions and our data. Following the analysis of the manufacturing company data, we collected information on the wage in effect as of November 1992 as a measure of the pre-training wage. In some specifications, we also include a wage measure from September, 1991. The company has provided us with the hourly wage in effect in mid-January, 1994 as a measure of post-training wages. Although our post-training wage is not after the training program had completely ended, it does capture wages after participation for most. Ninety-five percent of those workers who took at least one class took their first class during the first four sessions, that is before November, 1993.

A second outcome we examine is the number of performance nominations and awards. The company has a monthly employee recognition program in which supervisors, co-workers, or customers nominate workers who have performed exceptionally well. There are individual as well as group level awards. The program has been in effect for several years and the exact details change periodically. Nevertheless, for the period in which we collect data, each month approximately 20-30 individuals (including entire work groups) are nominated for these

[3] Results including the apprentices can be obtained from the authors upon request.

Figure 1b

Service Company



prizes, and about 5 winners are selected by a rotating committee. All nominees attend a luncheon and winners of individual awards receive $25, $50, or $75 to be determined by the committee. We collected the number of nominations and awards, both group and individual, that employees received from January, 1992 through November, 1992. We also recorded the number of nominations and awards for the period December, 1992 through February, 1994.

We treat nominations and awards as a reflection of worker productivity or motivation since those nominating an individual are asked to consider factors such as "extra effort," "team work," "quick action/short notice," "super quality effort," "problem solving," and "service excellence." Nominations require an explanation as to why the employee deserves the award, allowing us to observe the stated reasons for nomination. As a typical example, one group nomination reads,

> Their special team-minded dedication and sacrifice over the past several months. During this time period, each of them gave up part of their weekends in order to complete [customer] printing backlogs. Around-the-clock weekend printing has consecutively been scheduled for almost every month. Some operators have worked as much as 20+ hours.

An individual nomination describes,

> Volunteering to come in on a Saturday to work overtime printing thousands of [customer] letters. In the middle of the printing, he noticed that there would not be enough stock to complete the run. He called [his manager] at home to see what could be done. He then went out of his way to look up on line the stock location (a task that he was not familiar with) and then made several trips to the 4th floor to bring down enough letterhead to finish the job. These tasks are not a requirement of his job, but he recognized the urgency in order to meet the customer deadline.

While it is possible that employees were nominated for the mere fact that they had attended the training program, rather than for any real productivity improvements, the recorded reasons for nominating employees suggest otherwise. The correlation between total number of performance award nominations and wages in 1994 is 0.35, indicating that the award

nominations are correlated with productivity.

Our final sample from the service company consists of 220 individuals. We eliminated 38 employees who started working at the company after November, 1992, 31 workers not targeted for the program (this eliminates 15 union workers plus another 16 sales representatives and upper management employees), and 38 employees who left the company before mid-January, 1994.

A Comparison with the Current Population Survey

Table 1 compares our samples with national samples from the annual merge file of the outgoing rotation groups of the Current Population Survey (CPS) for 1991. The CPS samples in columns (2) and (4) are from the same industry and exclude managerial, professional, technical and sales occupations to be comparable to our company samples. In our service company, the workers are slightly older and better paid, and there is a greater proportion female and Black than in the CPS sample. On the other hand, the educational distributions are fairly similar. There is a smaller fraction of female employees and a larger proportion minority (Black and Hispanic) in the manufacturing company; the workers in our manufacturing company have slightly less education but are slightly better paid than the CPS sample. The smaller fraction ever-married in both companies is probably due to the fact that our information on this variable is not current since it is based on application forms. While our two companies cannot be representative of their industries because they are based in New Jersey, they are not obvious outliers either.

Company Surveys

To supplement our personnel and administrative data, we also conducted a survey of

Table 1

A Comparison of the Demographic Characteristics of Our Companies with the CPS Annual Merge File

Worker Characteristics	Industry				
	Durable Manufacturing		Service		All
	Company B (1)	CPS (2)	Company A (3)	CPS (4)	CPS (5)
Age	38.9	38.4	42.1	35.8	37.5
% Female	23.2	28.9	62.2	54.3	46.3
% Black	30.5	10.6	24.4	15.9	11.3
% Hispanic	18.7	9.1	4.4	12.5	7.8
% Ever-married	55.1	80.8	58.1	68.3	75.6
% Less than High School	19.6	21.7	17.7	18.1	12.1
% High School Grad	56.9	55.7	54.0	49.8	40.5
% Some College	21.9	17.1	22.2	21.6	22.3
% College Grad	1.5	5.2	6.0	10.0	24.8
Usual Weekly Hours of Work	40.0*	41.1	36.6	37.6	39.8
Hourly Wage ($1992)	$12.02	$10.48	$10.75	$8.30	$11.51

Notes: CPS data are from the 1991 Annual merge file of the outgoing rotation groups. The CPS and company samples consist of all individuals aged 16-65 who are currently working or have a job. It excludes the self-employed, those who usually work less than 5 hours per week or more than 80 hours per week, and those with hourly wages less than one-half of the minimum (hourly) wage or more than $100 per hour. All CPS means are weighted by the earnings weight. Columns (2) and (4) exclude managerial, professional, technical and sales occupations to be comparable to the company samples.

* The company does not hire part-time workers and the usual work week is 40 hours.

the employees in each company. (See Appendix A for a copy of the survey instrument.) The survey was conducted by asking employees to complete the questionnaire at work. At the manufacturing company the survey was conducted during the last 10-15 minutes of the management's bi-monthly "information meeting," whereas representatives of the service company scheduled production workers to complete the survey at specified times. The survey was conducted from mid-March through early April, 1994. The response rate among those who were approached was very high, approximately 95%.

The questionnaire elicited information on employees' attitudes towards their job, job performance relative to last year, interest in reading, educational aspirations for their children, as well as specific questions about why they did or did not participate in the training class. Further, we also asked workers for their martial status and education as our measures were from job applications and potentially out-of-date. Unfortunately, as of this writing, we only have results for the service company.

Measuring Participation

Our primary measure of participation in training is a dummy variable indicating whether an individual took at least one class in any of the five sessions. For the manufacturing company we also measure training as having taken at least one occupational class since these classes provided skills that would allow workers to become eligible for certain jobs within the company. We have experimented with other measures of participation such as the actual number of hours of class attended and a measure that weights participation by the months since the class (to reflect the fact that some individuals completed their classes in an early session while others were still enrolled in February, 1994). The results are fairly robust to alternative specifications.

For our analysis of subjective outcomes using the survey data from the service company, we use self-reported measures of training participation in order to maximize our sample size. To gauge the extent to which individuals correctly identified their training status in the survey data, we compared the self-reports of training to administrative records for the subset of the survey participants we could match with our survey sample. The results are reported below:

Comparison of Self-reported and Actual Reports of Participation

Manufacturing Company:

(Frequencies are Reported in Cells)

Actual Participation	Self-Reported Participation	
	Never Participated	Participated
Never Participated	127 (46%)	31 (11%)
Participated	9 (3%)	279 (40%)

Service Company:

(Frequencies are Reported in Cells)

Actual Participation	Self-Reported Participation	
	Never Participated	Participated
Never Participated	45 (35%)	7 (5%)
Participated	3 (2%)	75 (58%)

Eighty-six percent of the manufacturing company employees correctly reported their

training status, and 93 percent of service company employees correctly reported their training status. Interestingly, in both cases the more common error was for nontrainees to report having taken training. At the manufacturing company, 20% of nontrainees reported they took the training course, whereas the corresponding error rate for the service company is 13%. In both companies, about 10% of the employees who responded that they took training in our survey did not take the training course according to the administrative records. The high error rate leads one to be concerned about the impact of measurement error in studies of the effectiveness of on-the-job training that are based solely on worker self-reports of training.

III. Who Participates in Training?

Tables 2a and 2b present the means and standard deviations of key variables for employees of the manufacturing and service companies, disaggregated by whether or not they participated in the training program. We measure training status by the administrative records here. Because the occupational courses seem to be particularly germane at the manufacturing company, we present estimates for workers who took at least one occupational training class as well. In both companies, the trainees tend to be younger, more likely to be male, more likely to be nonwhite, and better educated than the non-trainees. Given these characteristics, it is not surprising that the pre-training average hourly wage of the trainees is lower than that of the non-trainees.

In Table 3 we present probit estimates of participation equations for each company. The dependent variable equals 1 if the employee participated in training, and 0 otherwise. Derivatives of the probabilities at the mean values of the variables are reported along with the probit coefficients. Again, for the manufacturing company we treat all training courses

Table 2a

Descriptive Statistics for Training Participants and Non-participants
Manufacturing Company
[Standard Deviation]

	Never Participated	Ever Participated	
		Any Class	Any Occupational Class
Age	40.2 [10.00]	38.9 [7.97]	37.5 [7.53]
Female	0.17 [0.38]	0.26 [0.44]	0.17 [0.37]
Non-white	0.43 [0.50]	0.49 [0.50]	0.52 [0.50]
Married	0.57 [0.49]	0.66 [0.47]	0.62 [0.49]
Years of Education	11.90 [1.34]	12.25 [1.27]	12.35 [1.32]
Tenure (years)*	10.12 [7.24]	8.31 [5.36]	7.90 [5.09]
Works 1st Shift (%)	0.72 [0.45]	0.69 [0.46]	0.68 [0.47]
Shift, missing	0.01 [0.12]	0.02 [0.13]	0.01 [0.11]
Hourly Wage, Oct. 1992**	12.54 [1.05]	12.19 [0.52]	12.22 [0.43]
No. of Job Postings Bid For, 1992	0.35 [0.82]	0.59 [1.30]	0.75 [1.44]
No. of Upgrades Received, 1992	0.05 [0.23]	0.12 [0.35]	0.18 [0.41]
Hourly Wage, Jan. 1994**	12.76 [1.01]	12.45 [0.53]	12.51 [0.45]
No. of Job Postings Bid For, 1993	0.33 [0.92]	0.71 [1.47]	1.11 [1.81]
No. of Upgrades Received, 1993	0.04 [0.23]	0.12 [0.34]	0.18 [0.41]
Total "Potential" Hours of Class Attended		43.7 [31.4]	52.5 [32.0]
Total "Actual" Hours of Class Attended		35.5 [27.6]	43.3 [29.4]
Took Any Occupational Classes		0.50 [0.50]	
No. of Observations	324	179	90

* Tenure is as of October, 1992.

** All wages are in 1993 dollars.

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Table 2b

Descriptive Statistics for Training Participants and Non-participants
Service Company
[Standard Deviation]

	Never Participated	Ever Participated
Age	48.5	37.5
	[15.0]	[11.1]
Female	0.62	0.70
	[0.49]	[0.46]
Non-white	0.28	0.33
	[0.45]	[0.47]
Married	0.67	0.48
	[0.47]	[0.50]
Years of Education	11.9	12.4
	[1.5]	[1.5]
Years of Education Missing	0.10	0.05
	[0.30]	[0.22]
Tenure (years)*	11.6	5.7
	[12.4]	[5.8]
Tenure < 1 year (%)*	0.08	0.13
	[0.27]	[0.34]
Production Worker	0.37	0.40
	[0.49]	[0.49]
Works 1st Shift (%)	0.77	0.89
	[0.42]	[0.31]
# of Workers in Department	9.4	10.7
	[6.6]	[7.4]
Hourly Wage, Nov. 1992**	11.06	10.35
	[3.24]	[2.45]
Avg. % of Regular Hours Worked per Week, 1992	0.94	0.93
	[0.05]	[0.04]
Total Number of Performance Nominations, 1992	0.76	0.81
	[0.90]	[0.91]
Total Number of Performance Wins, 1992	0.15	0.22
	[0.36]	[0.55]
Hourly Wage, Jan. 1994**	11.52	10.87
	[3.42]	[2.55]
Avg. % of Regular Hours Worked per Week, 1993	0.95	0.95
	[0.04]	[0.03]
Total Number of Performance Nominations, 1993	0.80	1.10
	[1.10]	[1.37]
Total Number of Performance Wins, 1993	0.33	0.42
	[0.65]	[0.68]
Total "Potential" Hours of Class Attended		37.4
		[28.5]
Total "Actual" Hours of Class Attended		28.5
		[23.8]
No. of Observations	99	121

* Tenure is as of November, 1992. ** All wages are in 1993 dollars.

Table 3

Training Participation Probits
(Asymptotic Standard Errors)

Dependent Variable: 1 = Ever Participates

	Manufacturing Co.				Service Co.	
	Took Any Class		Took Occupational Class		Took Any Class	
	Probit Coeff.	δP/δX*	Probit Coeff.	δP/δX*	Probit Coeff.	δP/δX*
Age	0.167	0.060	0.117	0.028	0.056	0.022
	(0.056)		(0.067)		(0.058)	
Age^2	-0.021	-0.007	-0.016	-0.004	-0.011	-0.004
(÷10)	(0.007)		(0.008)		(0.006)	
Female	0.279	0.101	-0.151	-0.036	0.314	0.124
	(0.154)		(0.181)		(0.242)	
Non-white	0.011	0.004	0.152	0.032	-0.074	-0.029
	(0.126)		(0.146)		(0.249)	
Married	0.379	0.137	0.134	0.036	-0.463	-0.183
	(0.130)		(0.143)		(0.222)	
Years of Education	0.173	0.063	0.140	0.033	0.074	0.029
	(0.051)		(0.057)		(0.076)	
Tenure (years)	0.035	0.013	0.026	0.006	-0.080	-0.032
	(0.035)		(0.041)		(0.044)	
$Tenure^2$	-0.018	-0.006	-0.013	-0.003	0.010	0.004
(÷10)	(0.013)		(0.016)		(0.009)	
Works 1st Shift	-0.137	-0.049	-0.091	-0.022	1.367	0.541
	(0.148)		(0.166)		(0.303)	
Production Worker					0.017	0.007
					(0.271)	
Department Size					0.040	0.016
					(0.018)	
Log(Hourly Wage), Oct. 1992	-5.621	-2.036	-3.702	-0.886	-0.920	-0.364
	(1.266)		(1.470)		(0.573)	
No. of Job Bids, 1992	0.127	0.046	0.144	0.034		
	(0.060)		(0.061)			
Avg. % of Regular Hours Worked per Week, 1992					-6.225	-2.463
					(3.256)	
No. of Vacation Days Allowed, 1992					-0.013	-0.005
					(0.033)	
Total Number of Performance Nominations, 1992					0.055	0.022
					(0.118)	
Pseudo-R^2	0.107		0.076		0.297	
No. of Observations	503		503		220	

Notes: All probits included a constant. The equation for the service company also included a dummy variable indicating whether education is missing, and the equation for the manufacturing company included a dummy variable indicating whether the work shift is missing.

* The derivatives of the probabilities are evaluated at the means of the independent variables.

and occupational training course separately.

First consider results for the manufacturing company. There is a statistically insignificant relationship between the incidence of training and tenure (p-value equals 0.27). Years of education have a positive and statistically significant effect on the incidence of training. There is not a statistically significant effect of the shift on training in the manufacturing company, probably because training courses were offered during all day shifts at this company. Workers who bid for job openings in the previous year were more likely to undergo training. Lastly, we find a negative relationship between the wage rate and the probability of training.

In several important respects, selection into training is different at the service company. Age, gender, race, and education are statistically insignificant determinants of training. The probability of undergoing training tends to fall slightly during the first four years of job tenure, and then rise thereafter (p-value equals 0.13). Higher paid workers are less likely to attend training. Workers on the first shift are significantly more likely to attend training, probably because courses were only offered during the first shift. Workers who are part of larger departments are more likely to have attended training, perhaps because it was easier for someone else to cover for them while they were off the floor. These findings point to negative selection into training, with the least skilled workers more likely to select training.

IV. The Effects of Training

A. Wage Effects

We estimate a variety of models to determine the impact on wages of participating in job training. Because we were particularly concerned about self-selection into training, the

basic specification we estimate is:

$$(1) \quad \Delta \ln W_{it} = \alpha + X_{it}\beta + \gamma T_{it} + \varepsilon_{it}$$

where $\Delta \ln W_{it}$ is the change in the log hourly wage between 1992 and 1994, X_{it} is a row vector of covariates (including age, tenure, gender, etc.), and T_{it} is a dummy variable that equals 1 if the worker participated in the training program between 1992 and 1994, and 0 if not. The coefficient γ measures the proportionate growth in wages associated with training. By modelling wage growth, we hope to net out any omitted fixed worker effects. Because wage growth is sensitive to tenure, we include a flexible functional form of tenure.[4] We assume ε_{it} is an error term that is uncorrelated with T_{it}. In some specifications, we also include as an explanatory variable the log wage in 1991, to allow for differential wage growth across the wage distribution.

Results of OLS growth equations are reported in Table 4a for the manufacturing company and 4b for the service company. (Standard cross-sectional semi-log wage regressions for the samples are reported in the Appendix Table 1.) Because of the smaller sample size and higher residual variance, the estimated training effects are much less precise for the service company than for the manufacturing company. When no other covariates are included, the wage growth equations indicate a positive association between training and wage growth in both companies. Including age and tenure greatly attenuates the training effect for the service company. If we include a quadratic in age and tenure, demographic variables, and job characteristic variables (column (3)), wage growth is insignificantly related

[4] Our results were qualitatively similar if we included a quartic in tenure, and dummy variables indicating different ranges of tenure.

Table 4a

The Effect of Training on Wages
Manufacturing Company

Dependent Variable: Log(Wage in 1994/Wage 1992) (Standard Errors)

	Participant = Any Classes				Participant = Occupational Classes			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Participant	0.004	0.004	0.003	0.002	0.006	0.005	0.005	0.004
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age		-0.002	0.013	0.016		-0.002	0.014	0.016
(÷10)		(0.001)	(0.007)	(0.007)		(0.001)	(0.007)	(0.007)
Age^2			-0.019	-0.022			-0.019	-0.022
(÷1000)			(0.009)	(0.009)			(0.008)	(0.009)
Tenure (Yrs)		-0.001	-0.010	-0.007		-0.001	-0.010	-0.007
(÷10)		(0.001)	(0.005)	(0.005)		(0.001)	(0.005)	(0.005)
$Tenure^2$			0.028	0.023			0.028	-0.023
(÷1000)			(0.017)	(0.017)			(0.017)	(0.017)
Female			0.005	0.003			0.005	0.003
			(0.002)	(0.002)			(0.002)	(0.002)
Nonwhite			0.002	0.000			0.002	-0.0001
			(0.002)	(0.002)			(0.002)	(0.002)
Ever-married			-0.003	-0.002			-0.002	-0.001
			(0.002)	(0.002)			(0.002)	(0.002)
Education (Yrs)			-0.001	-0.0002			-0.001	-0.0003
			(0.001)	(0.0007)			(0.001)	(0.0007)
1st Shift			0.004	0.003			0.004	0.003
			(0.002)	(0.002)			(0.002)	(0.002)
No. of Job Bids			-0.015	-0.016			-0.015	-0.016
(1992) (÷10)			(0.010)	(0.010)			(0.010)	(0.010)
No. Job Upgrades			0.018	0.010			0.014	0.007
(1992) (÷10)			(0.036)	(0.036)			(0.036)	(0.036)
Log Wage in 1991				-0.061				-0.060
				(0.015)				(0.015)
Constant	0.017	0.027	0.009	0.151	0.018	0.027	0.008	0.150
	(0.001)	(0.004)	(0.016)	(0.038)	(0.001)	(0.004)	(0.016)	(0.038)
R^2	0.011	0.026	0.070	0.101	0.012	0.026	0.073	0.105

Notes: Sample size is 503 except in columns (4) and (8) where it is 496. Regressions also include a dummy variable indicating whether the shift is missing.

Table 4b

The Effect of Training on Wages
Service Company

Dependent Variable: Log(Wage in 1994/Wage in 1992)

	(1)	(2)	(3)	(4)
Participant	0.010	0.0001	-0.005	-0.016
	(0.007)	(0.0074)	(0.008)	(0.008)
Age		-0.009	-0.009	-0.016
(÷10)		(0.003)	(0.017)	(0.017)
Age^2			-0.002	-0.002
(÷1000)			(0.018)	(0.018)
Tenure (Yrs)		0.0001	-0.018	-0.006
(÷10)		(0.004)	(0.009)	(0.010)
$Tenure^2$			0.037	0.020
(÷1000)			(0.019)	(0.019)
Female			0.007	0.007
			(0.007)	(0.008)
Nonwhite			-0.009	-0.007
			(0.008)	(0.008)
Ever-married			-0.0001	-0.004
			(0.007)	(0.007)
Education (Yrs)			-0.0002	0.002
			(0.002)	(0.003)
Production Worker			0.026	0.014
			(0.009)	(0.009)
1st Shift			0.016	0.026
			(0.010)	(0.010)
Size of Department			-0.014	-0.001
(÷10)			(0.006)	(0.001)
Log Wage in 1991				-0.036
				(0.018)
Constant	0.039	0.085	0.094	0.163
	(0.005)	(0.014)	(0.047)	(0.060)
R^2	0.010	0.065	0.151	0.195
No. of Observations	220	220	220	197

Notes: Standard errors are in parentheses. Regressions also a dummy variable indicating whether education is missing.

to the variable that measures whether the worker took any training at either company.

When we include the 1991 log wage as an explanatory variable in column (4), the coefficient on the training variable is even smaller for the manufacturing company and negative with a t-ratio close to 2 for the service company. One problem with this specification, however, is that we must drop 10 percent of our sample at the service company because workers must be employed for three continuous years to have wages each period; thus, low tenure workers are dropped from the sample. If we restrict the sample to low-tenure workers (tenure under 5 years) and estimate the specification in column (3) for the service company, the training coefficient is 0.015 with a standard error of 0.014. Eliminating low-tenure workers changes the composition of the sample, and may have an important effect on the estimated return to training.

If we focus solely on occupational classes (columns 5-8 of Table 4a), the training variable has a more robust, positive association with wage growth at the manufacturing company. For example, taking an occupational education class is estimated to increase earnings growth by 0.6 percent when no covariates are included, and by 0.4 percent when age, tenure, demographic variables, and the pre-training wage are held constant (column 8). The findings for the occupational education classes are consistent with the importance that company officials attached to specific occupational skills, such as the ability to read a blueprint. In some jobs in this company, proficiency in reading blueprints is a requirement for promotion.

B. Effects on Job Bids and Upgrades

At the manufacturing company, 23% of the employees in our sample bid for jobs in

1993. Just under 30% percent of those who applied received at least one upgrade.[5] In Tables 5a and 5b we analyze the extent to which the training classes may have affected the likelihood that an employee bid for a job or received a job upgrade in 1993 using an ordered probit model.[6] This model assumes a latent-variable structure of the form:

(2) $y^* = \beta'X + \varepsilon.$

We observe (assuming three categories),

$y = 0$ if $\varepsilon < \beta'X$,

$y = 1$ if $\beta'X < \varepsilon < \beta'X+\lambda$,

$y = 2$ if $\beta'X+\lambda < \varepsilon$,

where $\lambda>0$, and,

$P_0 = F(\beta'X)$

$P_1 = F(\beta'X+\lambda) - F(\beta'X)$

$P_2 = 1- F(\beta'X+\lambda).$

The model easily generalizes to more than three categories.

Because union rules stipulate that the employer must choose the most senior employee among those qualified when filling a job posting, we were careful to control for tenure (or seniority). In the results shown here, we include a quartic in tenure, however, the results are robust to several alternative specifications. As usual, we define participation in two ways: having taken any of the training classes and having taken any of the occupational classes.

In the columns (1) and (5) of Table 5a we find that training participants bid for more

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[5] These percentages are roughly the same for the full sample before our exclusions.

[6] We have also modeled the data using OLS, a binary probit as to whether an individual ever bid or ever received an upgrade, and a Poisson model for count data. The results are invariant to the choice among these models.

Table 5a

The Effect of Training on Number of Job Bids
Manufacturing Company
Ordered Probit Model

Dependent Variable: Number of Job Bids, 1993 (Asymptotic Standard Errors)

	Participant = Any Classes			Participant = Occupational Classes		
	(1)	(2)	(3)	(5)	(6)	(7)
Participant	0.390	0.416	0.403	0.752	0.745	0.750
	(0.121)	(0.138)	(0.139)	(0.140)	(0.154)	(0.156)
No. Job Bids, 1992		0.407	0.410		0.417	0.419
		(0.059)	(0.060)		(0.060)	(0.060)
No. Job Upgrades, 1992		-0.339	-0.444		-0.450	-0.534
		(0.217)	(0.227)		(0.221)	(0.231)
λ_1	0.879	-0.203	-1.193	0.889	-0.170	-0.879
	(0.079)	(2.887)	(2.993)	(0.070)	(2.887)	(2.991)
λ_2	1.456	0.528	-0.446	1.484	0.580	-0.109
	(0.093)	(2.887)	(2.992)	(0.087)	(2.887)	(2.990)
λ_3	1.725	0.883	-0.101	1.764	0.947	0.248
	(0.105)	(2.886)	(2.992)	(0.101)	(2.887)	(2.989)
λ_4	2.034	1.284	0.313	2.089	1.369	0.682
	(0.125)	(2.887)	(2.992)	(0.124)	(2.888)	(2.990)
λ_5	2.244	1.545	0.582	2.312	1.647	0.967
	(0.145)	(2.889)	(2.992)	(0.146)	(2.889)	(2.990)
λ_6	2.526	1.874	0.919	2.609	1.994	1.322
	(0.182)	(2.890)	(2.993)	(0.185)	(2.891)	(2.992)
λ_7	2.609	1.972	1.019	2.696	2.097	1.426
	(0.195)	(2.891)	(2.994)	(0.200)	(2.892)	(2.992)
λ_8	2.713	2.100	1.151	2.805	2.231	1.564
	(0.216)	(2.893)	(2.995)	(0.221)	(2.894)	(2.994)
λ_9	3.075	2.523	1.592	3.174	2.659	2.007
	(0.320)	(2.902)	(3.004)	(0.324)	(2.904)	(3.003)
Controls for Personal Characterics?	no	yes	yes	no	yes	yes
Controls for Wage in 1991?	no	no	yes	no	no	yes
Pseudo-R^2	0.012	0.148	0.153	0.033	0.164	0.170
N	503	503	496	503	503	496

Notes: Personal characteristcs include a quadratic in age, a quartic in tenure, log wage in 1992, dummy variables indicating whether female, nonwhite, ever-married, works 1st shift or whether shift is missing, and years of education.

jobs than non-participants whether they took any class or took any occupational class. The difference is statistically significant at the 5% level. Because the coefficients from the ordered probit are not easily interpreted, another way to gauge the difference is that those who took any class had a 10 percentage point increase in their likelihood of bidding for at least one job than non-participants; those who took at least one occupational class were 21 points more likely to bid than non-participants and those who never took an occupational class.[7] In columns (2) and (6) we add controls for the number of job bids and job upgrades in 1992. The coefficient on number of previous job upgrades is negative and insignificant, however, the coefficients on number of previous job bids is positive and statistically significant. Adding previous bids and job changes, as well as personal characteristics such as demographic variables, tenure, age, education, and log wage in 1992, increases the participation coefficients slightly. Finally, we also include the log wage that individuals employed at the company in 1991 earned as of July 1991. Although not shown, the coefficient is typically negative and insignificant. Further, it has little effect on the participation coefficients.

The results of the effect of the training classes on the number of job upgrades are presented in Table 5b which has an identical structure to Table 5a. Again, the coefficients in columns (1) and (5) indicate that training participants were significantly more likely to receive job changes. Those who took at least one class are 7 points more likely than non-participants and those who took at least one occupational course are 8.5 points more likely than those who never took an occupational class to receive a job change. As in Table 5a, those taking classes continue to be more likely to receive job upgrades than non-participants

[7] The probability difference is based upon a binary probit and the derivative of the probability is evaluated at the mean of the independent variable.

Table 5b

The Effect of Training on Number of Job Upgrades
Manufacturing Company
Ordered Probit Model

Dependent Variable: Number of Job Upgrades, 1993 (Asymptotic Standard Errors)

	Participant = Any Classes			Participant = Occupational Classes		
	(1)	(2)	(3)	(5)	(6)	(7)
Participant	0.567	0.739	0.752	0.761	0.881	0.880
	(0.180)	(0.215)	(0.217)	(0.191)	(0.226)	(0.230)
No. Job Bids, 1992		0.071	0.067		0.087	0.081
		(0.093)	(0.093)		(0.092)	(0.092)
No. Job Upgrades, 1992		-0.132	-0.143		-0.283	-0.268
		(0.321)	(0.329)		(0.330)	(0.337)
λ_1	1.805	-1.901	-2.924	1.754	-2.036	-2.502
	(0.132)	(5.205)	(5.493)	(0.112)	(5.190)	(5.377)
λ_2	2.799	-0.727	-1.735	2.775	-0.833	-1.290
	(0.227)	(5.204)	(5.490)	(0.222)	(5.189)	(5.373)
Controls for Personal Characterics?	no	yes	yes	no	yes	yes
Controls for Wage in 1991?	no	no	yes	no	no	yes
Pseudo-R^2	0.040	0.196	0.202	0.060	0.207	0.210
No. of Observations	503	503	496	503	503	496

Notes: Personal characteristcs include a quadratic in age, a quartic in tenure, log wage in 1992, dummy variables indicating whether female, nonwhite, ever-married, works 1st shift or whether shift is missing, and years of education.

conditional on personal characteristics and on the wage received in 1991. Overall, the evidence suggests that, in the absence of additional self-selection for which we have not controlled, the training program encourages employees to bid for more jobs and improves their likelihood of receiving job changes.

C. Effects on Performance Awards

The results of the effect of the training program on performance awards in the service company are presented in Table 6. The estimates are from OLS regressions. Because a maximum of five individual nominations, four group nominations, and two awards of each type were received, we also estimated the models using ordered probits, as well as binary probits (on whether ever nominated or ever awarded) with similar results. The first column in each block presents the raw difference in the number of nominations or wins between participants and non-participants, the second column controls for past awards or nominations, and the final column also includes personal characteristics.

In looking at individual nominations, before conditioning on other variables, participants received 0.24 more nominations than did non-participants with a p-value equal to 0.076. Forty-nine percent of participants were nominated for at least one individual award in 1993, as compared to 36% of non-participants. In column (2), the coefficient on number of individual nominations received in 1992 is positive and significant at the 10% level suggesting that those who have received nominations in the past are more likely to receive them in the future. However, the coefficient on the number of individual nominations received in 1993 remains virtually unchanged, reflecting that the number of nominations received in 1992 is only weakly correlated with participant status (as also found in Table 3). With the addition of personal characteristics such as demographic information, years of

Table 6

The Effect of Training on Performance Awards
Service Company

Dependent Variable: Number of individual/group nominations or wins for performance awards in 1993

	Individual						Group					
	Nominations			Awards			Nominations			Awards		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Participant	0.231 (0.130)	0.234 (0.129)	0.140 (0.149)	0.024 (0.065)	0.024 (0.065)	0.012 (0.076)	0.078 (0.087)	0.045 (0.086)	0.024 (0.099)	0.073 (0.054)	0.072 (0.054)	0.029 (0.065)
No. Individual Nominations, 1992		0.137 (0.075)	0.101 (0.079)									
No. Group Nominations, 1992								0.455 (0.168)	0.514 (0.164)			
No. Individual Awards, 1992					0.069 (0.082)	0.048 (0.081)						
No. Group Awards, 1992											0.011 (0.106)	0.051 (0.108)
Controls for Demographics/Job Characteristics?	no	no	yes	no	no	yes	no	no	yes	no	no	yes
R^2	0.014	0.029	0.176	0.001	0.004	0.151	0.004	0.036	0.220	0.008	0.008	0.133

Notes: Standard errors are in parentheses. Sample size is 220. All specifications include a constant. Controls for demographic and job characteristics include female, nonwhite, married, years of education, a quartic in years of tenure, a quadratic in age, the size of the department, and dummy variables indicating whether education is missing, a production worker, or works first shift.

education, and tenure, the coefficient decreases in size and becomes statistically insignificant at any typical significance level.

The effects of the classes on the number of individual awards, group nominations, and group awards were smaller in magnitude and statistically insignificant. In three of the four cases, controlling for past nominations or awards alone did not change the coefficient on the participation dummy, while adding personal characteristics had a relatively larger effect. Thus, while there is some evidence that training participants were more likely to be nominated for performance awards, the difference appears to be largely explained by other personal characteristics.[8]

D. Subjective Evaluations

Our survey enables us to investigate the effect of participating in job training on the answers to a variety of subjective questions. For examples, we asked workers about their satisfaction with their company, desire to take additional training classes, educational aspirations for their children and grandchildren, and job performance. We tabulated the mean responses to these questions for training participants and non-participants. In addition, we adjusted the differences between the participants and non-participants by estimating a regression of the response to subjective questions on an intercept, years of education, tenure, and gender and marital status dummies. These results are presented in Table 7a for the manufacturing company and Table 7b for the service company.

For almost all of the subjective variables that we examined, there is not a statistically significant difference between the trainees and non-trainees. For example, 84 percent of

[8] As with other outcomes we consider, there may be some overlap in the timing of the performance award or job bid and participation in the training program. We plan to explore the effect of these timing issues in future drafts.

Table 7a

The Effect of Training on Other Outcomes
Survey Results for Manufacturing Company

Outcome	Mean of Outcome			
	Participants	Non-Participants	Unadjusted Difference (Std. Error)	Regression Adjusted Difference* (Std. Error)
Likes Working at Company Alot/Somewhat	0.84	0.80	0.04 (0.04)	0.01 (0.04)
Has Applied for Jobs in Other Companies in Last Four Weeks	0.07	0.10	-0.02 (0.03)	-0.04 (0.03)
Currently Belongs to Community/Religious Organizations	0.52	0.42	0.10 (0.05)	0.08 (0.05)
Takes a Leadership Role in a Community/Religious Organization**	0.43	0.43	0.0003 (0.07)	0.03 (0.08)
Highest Grade Would Like Child/Grandchild to Attend	14.94	14.83	0.11 (0.24)	0.01 (0.24)
Has Read/Looked into Any Magazines/Books in Last Four Weeks	0.91	0.91	-0.003 (0.03)	-0.03 (0.03)
Plans to Take More Classes in Near Future	0.45	0.32	0.13 (0.05)	0.09 (0.05)
Thinks Supervisor Would Say Makes Fewer Errors Than a Year Ago	0.42	0.48	-0.06 (0.05)	-0.08 (0.05)
Thinks Supervisor Would Say Doing Job Better Than a Year Ago	0.49	0.50	-0.01 (0.05)	-0.02 (0.05)

Notes: Sample sizes vary according to data availability; they are on average about 400. See Appendix A for a copy of the survey instrument and the exact wording of the questions.

* Other independent variables include an intercept, years of education, years of tenure, and whether married.

** These means are conditional on currently belonging to a community or religious organization.

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Table 7b

The Effect of Training on Other Outcomes
Survey Results for Service Company

Outcome	Mean of Outcome: Participants	Mean of Outcome: Non-Participants	Unadjusted Difference (Std. Error)	Regression Adjusted Difference* (Std. Error)
Likes Working at Company Alot/Somewhat	0.92	0.90	0.01 (0.04)	0.01 (0.05)
Has Applied for Jobs in Other Companies in Last Four Weeks	0.05	0.07	-0.01 (0.03)	-0.01 (0.04)
Currently Belongs to Community/Religious Organizations	0.47	0.42	0.05 (0.07)	0.05 (0.08)
Takes a Leadership Role in a Community/Religious Organization**	0.38	0.36	0.02 (0.11)	0.02 (0.11)
Highest Grade Would Like Child/Grandchild to Attend	15.63	15.22	0.40 (0.40)	0.45 (0.36)
Has Read/Looked into Any Magazines/Books in Last Four Weeks	0.93	0.88	0.04 (0.04)	0.03 (0.04)
Plans to Take More Classes in Near Future	0.53	0.41	0.13 (0.07)	0.13 (0.07)
Thinks Supervisor Would Say Makes Fewer Errors Than a Year Ago	0.57	0.45	0.12 (0.07)	0.07 (0.08)
Thinks Supervisor Would Say Doing Job Better Than a Year Ago	0.69	0.39	0.31 (0.07)	0.27 (0.07)

Notes: Sample sizes vary according to data availability; they are on average about 160. See Appendix A for a copy of the survey instrument and the exact wording of the questions.

* Other independent variables include an intercept, years of education, years of tenure, and whether married or female.

** These means are conditional on currently belonging to a community or religious organization.

training participants and 80 percent of non-participants reported that they like working at their company a lot or somewhat, with a t-ratio of 1.0 on the difference. (The corresponding figures are 92 and 90 percent at the service company.) Although trainees are less likely to apply for jobs in other companies, more likely to belong to religious and community organizations, have higher educational aspirations for their children or grandchildren, and are more likely to read books or magazines than non-trainees, the differences between trainees and non-trainees on these variables are all statistically insignificant and fairly small.

We find, however, that at both companies trainees are significantly more likely than non-trainees to report that they plan to take additional classes in the near future. This finding would be unexpected if trainees considered their training worthless. Perhaps more significantly, at the service company the average improvement in self-reported job performance is higher among trainees than among non-trainees. For example, trainees are 31 percentage points more likely to report that their supervisor would say they are doing a better job currently than a year ago (before training). Whether these results signify that trainees' actual job performance has improved, or are just a reflection of improved self-esteem from training is an open question.

V. Conclusion

We conclude by crudely comparing the likely benefits and costs of the training program. Earlier we noted that the total cost of training (direct expenses and release time) for these programs was approximately 4 percent of the average trainee's annual compensation. How large is the return on training that is required to justify this investment? If we assume that completed job tenure is 20 years (twice average incomplete tenure spells),

and use a 3 percent real discount rate, then the training program would need to generate a 0.275 percent annual return to cover its costs in present value.

How do our estimated benefits compare to the required rate of return? The most direct monetary estimates we have of the return to the training is the wage growth associated with participating in training. For the manufacturing company these estimates are between 0.4 and 0.6 percent for occupational classes, whereas for the service company the estimates are typically insignificantly different from zero (as well as from 0.275 percent). On the other hand, it is possible that the social return to the training is higher than the measured private wage growth because workers may not capture all (or even most) of the proceeds of their increased productivity from job training. There are several additional caveats that are necessary to qualify this favorable interpretation. Perhaps most importantly, one could easily question whether the higher wage growth we document for trainees at the manufacturing company is causally linked to the training program. In addition, we do not know whether the short term 0.4-0.6 percent wage growth associated with occupational training is an effect that lasts 20 years. And although we plan to follow-up the long-term effects of the training program, we have no way of following workers who leave the companies. This may be a significant limitation because Topel and Ward (1992) document that significant wage gains are associated with mobility.

If the payoff from training dissipates before 20 years, or if the estimated effect is biased upward, the benefits of job training would be smaller than we estimated. Nevertheless, we interpret our results as suggesting that the measured return to investment is probably in the same ballpark as the required rate of return. Naturally, more analysis would be useful to determine if the training were cost effective.

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Appendix Table 1

Cross Section Wage Equations
Service and Manufacturing Companies

Dependent Variable: Log Hourly Wage in 1992 or 1994

	Service Company		Manufacturing Company	
	1992	1994	1992	1994
Age	0.073	0.073	0.025	0.041
(÷10)	(0.069)	(0.069)	(0.023)	(0.022)
Age^2	-0.146	-0.153	-0.027	-0.047
(÷1000)	(0.074)	(0.073)	(0.027)	(0.026)
Tenure (Yrs)	0.184	0.169	0.033	0.026
(÷10)	(0.038)	(0.038)	(0.014)	(0.015)
$Tenure^2$	-0.163	-0.123	-0.050	-0.027
(÷1000)	(0.076)	(0.074)	(0.051)	(0.049)
Female	-0.103	-0.103	-0.037	-0.032
	(0.030)	(0.029)	(0.007)	(0.007)
Nonwhite	-0.129	-0.141	-0.036	-0.034
	(0.031)	(0.031)	(0.005)	(0.005)
Ever-married	0.052	0.053	0.015	0.013
	(0.029)	(0.029)	(0.006)	(0.005)
Education	0.045	0.044	0.009	0.008
(Yrs)	(0.010)	(0.010)	(0.002)	(0.002)
Constant	1.715	1.788	2.343	2.341
	(0.192)	(0.193)	(0.049)	(0.049)
R^2	0.373	0.395	0.233	0.213
No. of Observations	220	220	503	503

Notes: Standard errors are in parentheses. The regression for the service company also included a dummy variable indicating whether education is missing.

Appendix A

Company Survey Instrument*

*Note: Question 12, 12a and 15 were not asked at the manufacturing company.

Skills Classes Survey

Thank you for taking the time to complete this questionnaire. The purpose of this questionnaire is to learn more about the effectiveness of the *Skills* classes and to design a better program in the future. Even if you did not take any *Skills* classes, your cooperation is very important and greatly appreciated. While we hope that you will fully answer all questions, even your partial response would be helpful.

All information that you provide will be strictly confidential and will not be disclosed or released to others for any purpose. The data will only be used for statistical purposes. We ask you to provide your name to help us process the data. Under no circumstances will anyone at this company or from the *Skills* program know your identity or be able to link your response to your name.

How to show your answers

Most questions have answer categories. For these questions, just circle the number in front of the answer category that fits you best. Some questions ask you to circle more than one number.

For example:

My favorite season is
(Circle one)

1 Spring
2 Summer
3 Fall
4 Winter

A few questions ask for write-in answers.

If you have any questions or concerns, do not hesitate to talk with one of the survey representatives. We would be happy to help you.

Your Name _____

Please turn the page and begin.

SECTION I: Tell us a couple of things about yourself.

1. What is your current marital status? (Circle one)
   1 Never-married
   2 Married
   3 Widowed
   4 Divorced/Separated

2. Is English your first language? (Circle one)
   1 Yes
   2 No
   3 Not sure

3. How do you usually get to work? (Circle as many as apply)
   1 I drive myself (car or motorcycle)
   2 Someone else drives me
   3 Bus (or other public transportation)
   4 Walk or bicycle
   5 Other

4. How long have you been working for your present employer? (Fill-in or circle the 'X')
   _____ years (if more than 1 year)
   _____ months (if less than 1 year)
   X Can't even guess

5. In addition to your job at this company, do you have any other jobs that you do after hours or on weekends? (Circle one)
   1 Yes
   2 No
   3 Not sure

SECTION II: The questions in this section are about your attitudes towards your job.

6. How much do you like working at this company? (Circle one)
   1 A lot
   2 Somewhat
   3 A little
   4 Not too much
   5 Not sure

7. Have you applied for any jobs in other companies in the last four weeks? (Circle one)
   1 Yes
   2 No
   3 Not sure

8. Do you think that your supervisor would say that you make.... (Circle one)
   1 fewer errors than a year ago
   2 about the same number of errors as a year ago
   3 not sure

9. Do you think that your supervisor would say that you are doing your job.... (Circle one)
   1 better than you did a year ago
   2 about the same as a year ago
   3 not sure

SECTION III: We'd now like to ask you a few questions about you and the people you work with regularly. If you would answer differently for different people, give us your overall impression.
None of your co-workers or supervisors will see your answers.

10. If one or more of the people in your work area took *Skills* classes, did you ever have to work harder while they were in class?
(Circle one)

1 Yes
2 No
3 Not sure
4 I was in class, too
5 None of them took classes

11. Compared with 1992 (over a year ago, before the classes began) does your group work together better as a team because of the *Skills* classes? (Circle one)

1 Yes
2 No
3 Not sure
4 None of us took classes

12. Who at this company do you work with regularly? (If you can think of more than one person, just pick one of them.)
(Fill in a name or circle the 'X')

Name _____
X Can't think of anyone

12a. Did he/she take any *Skills* classes?
(Circle one)

1 Yes
2 No
3 Not sure

The next three questions are about pay. Remember that the questionnaire is confidential.

13. How much do you usually earn per hour? (regular pay not overtime)
(Fill in or circle the 'X')

$ _____/hour
X Not sure

14. Which of the following is true about the people you work with more regularly?
(Circle one)

1 Most of us know each other's pay
2 Some of us know, most of us guess
3 Most us do not know
4 Not sure

15. How much do you <u>think</u> the co-worker you mentioned in Question 12 <u>now</u> earns per hour? (Fill in or circle the 'X')

$ _____/hour
X Can't even guess

SECTION IV: The questions in this section are about your family and your activities outside of work.

16. How far in school do you want your oldest child or grandchild (aged 18 or younger) to go? (Circle one)

1 At least some high school
2 Graduate from high school
3 Attend vocational, trade, or business school after high school
4 At least some community or four-year college
5 Graduate from a community or four-year college
6 Attend graduate school
7 I have no child/grandchild that age

17. Do you currently belong to any community or religious organizations? (Circle one)

1 Yes
2 No
3 I did, but I don't any more
4 I would, but I don't have the time
5 Not sure

17a. If yes, do you take a leadership role in any of them? (Circle one)

1 Yes
2 No
3 Not sure

18. In the past four weeks, did you happen to read or look into any magazines or books? (Circle one)

1 Yes
2 No
3 Not sure

19. How far in school have you gone? (Circle the highest level you have attained)

1 I did not graduated from high school
2 I have a high school diploma or equivalency degree (GED)
3 I attended a vocational, trade, or business school
4 I attended a community or four-year college, but did not graduate
5 I graduated from a community college (AA)
6 I graduated from a four-year college (BA)
7 I have attended graduate school
8 Not Sure

20. In the near future, do you plan to take, or are you currently taking, any high school, college, or vocational school classes? (Circle one)

1 Yes
2 No
3 Not sure

SECTION V: The questions in this section are about the *Skills* classes.

21. Did you take any *Skills* classes? (Circle one)

1 Yes (Please skip to Question 25)
2 No (Please continue)

Please answer the following questions if you did not take any *Skills* classes.
(If you did take any *Skills* classes, please skip to Question 25)

22. Why did you not take the *Skills* class(es)? (Circle as many as apply)

1 Not interested
2 Didn't need it
3 Couldn't get off the floor
4 Other (please specify below)

23. If this company were to continue to offer classes, would you consider taking a class? (Circle one)

1 Yes
2 No
3 Not sure

23a. If yes, what classes would you like to see offered? (Please answer in the space below)

23b. If no, why not?
(Please answer in the space below)

24. Is there anything about the classes that is not covered above and that you would like us to know about? (Please use the space below.)

You have finished. Thank you very much for your time; we greatly appreciate your help.
Please put the survey in the box.

Please answer the following questions if you did take one or more *Skills* classes. In the following questions, you may refer to any or all of the classes you have taken. We're primarily interested in your overall impression of the class(es).

25. Why did you take the *Skills* class(es)? (Circle as many as apply.)

1 I wanted to improve/update my skills in general
2 I needed to know more about a subject
3 My supervisor made me do it
4 I wanted to prepare for the GED
5 I wanted to improve my English
6 I wanted to get off the floor
7 I wanted to learn enough to help my children/grandchildren at home
8 Other (please specify below)

26. Were you more likely to come to work on the days you had a class? (Circle one)

1 Yes
2 No
3 Not sure

27. Do the skills you learned in class help you with your current job and/or would they help with future jobs at this company? (Circle one)

1 Yes
2 No
3 Not sure

27a. Which skills are helpful and how do they help? (Please answer in the space below.)

28. If this company were to continue to provide classes, would you recommend them to a friend? (Circle one)

1 Yes
2 No
3 Not sure

29. If this company were to continue to provide classes, would you consider taking more classes? (Circle one)

1 Yes
2 No
3 Not sure

29a. If yes, what classes would you like to see offered? (Please answer in the space below)

29b. If no, why not?
(Please answer in the space below)

30. All things considered, how useful do you think the *Skills* classes are to you now on your job? (Circle one)

1 Useful: I learned some things and am able to use them
2 Somewhat useful: There were a few good ideas, but some wasted time as well
3 Not too useful: I could have gotten along fine without it
4 Not sure

31. Is there anything about the classes that is not covered above and that you would like us to know about? (Please use the space below.)

You have finished. Thank you very much for your time; we greatly appreciate your help.
Please put the survey in the box.

Anecdotal Comments:

The following speech was written by a 53 year old woman who began our program reading on a first grade level. She persevered throughout the program and, upon completion was reading at a fourth grade level. As our graduation speaker she made the following comments that impressed both her peers and management alike. In addition, her adult daughter came to the ceremony and surprised her mother with flowers and balloons. There was not a dry eye in the meeting room.

Speech by L.M.
March 1994
The ***Skills 2000 Program*** has made a big difference in my life. I function with great confidence. My reading skills have improved beyond belief. I never expected to be able to understand what I read with little or no help at all. I'm even starting to read more.

I owe it all to my teachers. Jean has taught me math skills that help me balance my orders and add faster. Lorna has been the driving force that made me want to learn more. She has taken extra time with me to help me break down words I don't know and pronounce them right. Between her and the support of my family my reading level went way up.

The program has made learning fun. They gave us word puzzles and games to make it easier to learn.

VIII. Workplace Barriers: Challenges and Solutions

Time Constraints

Perhaps one of the most critical problems to a workplace education program is finding training time for the workers. While every organization may feel that training has its merits, the obvious problem educators need to deal with is finding time to train in companies that are now staffed lean to be most cost effective. While the easy solution would be to train workers on their own time, we found that this was not possible in our situation. First, many men and women had child care responsibilities after work. Others had second jobs. A smaller number had carpool or transportation problems. Some just felt that after forty hours a week at work they did not have the patience to stay longer for training.

Therefore, the partners had to decide the next best solution to training; either shared time or total company release time. In the end, because there was so many people to train on shifts that kept changing, the partners made the decision to train only on company time.

This total release time had its pluses and minuses. Employees benefited because they had no barriers to education. The program was on site during company hours. On the surface it cost them nothing to attend. In reality, the class time was a give and take for both management and employees. Management had to arrange temporary coverage workstations and plan for the unexpected absenteeism and vacations. This left the floors staffed very lean and often cut into production. Many employees felt they were letting down the company by attending classes and rushed back to their stations after classes to pick up where they left off. At other times the workload was so intense that employees were not allowed to attend the classes, and teachers and students had to make special arrangements to complete the work.

The federal budget for the grant covered all expenditures for the program and there was no financial problems accomplishing the goals. The companies also allocated money for temporary help and wages for students. This $364,284 outlay was a tremendous commitment to the project. The partners felt that this program was cost effective because it cost $21 per class hour for instruction, which is comparable to community college costs.

Program Costs

Session	Wages/In-kind Contributions	The Hibbert Group	The Trane Company
Start-up		$7,843	$15,320
One	Wages/In-kind	$21,977	$66,600
Two	Wages/In-kind	$20,248	$53,640
Three	Wages/In-kind	$ 15,299	$58,260
Four	Wages/In-kind	$10,394	$59,520
Five	Wages/In-kind	$14,283	$40,500
	Totals	Hibbert	Trane
	Subtotal	$91,244	$273,040
	Total Partner Contribution	$364,284	
	Total Federal Contribution	$408,873	
	Class Hours	5,578	12,106
	Total Class Hours	17,684	
	Number of Students	185	305
	Total Students	490	
	Cost per Student	$21	

Originally we had anticipated an enrollment of at least 600 students in both companies. Unfortunately, unforeseen business situations, both positive and negative, kept us from meeting this goal. At Trane, an air conditioning and heating manufacturer, is a company that runs on seasonal business. Our first day of classes foretold what would be ahead of us over the next fifteen months because there was a layoff of one third of their workforce. Over the next fifteen months their workforce went from one shift to three, from one hundred per cent employment to forty per cent and back up again. Sometimes our classes were completely full. Other times the classes were half full. Nevertheless, Trane kept their commitment and always promoted the training to help keep the classes running. In the end, 305 people were enrolled for the classes and over 78% completed their goals.

At the Hibbert Group we experienced the reverse problem. Business was always so good that the company had difficulty allowing employees to go to classes. Despite temps being hired, there was always more work than staff. To accommodate the company, we split the training program between the office and production staffs to keep production going. As in any small company (under 300) the departments were very small. To run classes of up to ten people meat reducing the workforce 20-50% for that two hour segment. This size consideration caused concern at times. The final total of 185 employees out of a possible 250 people eligible showed the great commitment of this company to the project. Hibbert participation ranged from 82% completion rate during slower seasons to 71% completion during the busiest season.

The partners' problems with classes reflected downsizing, upsizing and rightsizing. When the business climate was optimum there was little problem releasing their staff for classes. At other times it was difficult to reduce production or delay shipment while students participated in the program. This release time issue was the only negative comment either company had about the training. Over the fifteen months there were attempts to decrease the effects of reduced staff. All classes were composed of employees from several departments so there were never more than two people from any one area. Classes were given at different times to allow various shifts to participate. Trane ran a forty hour a week training program, which included training and tutoring from our project, and 12 hours a week that the company used to provided internal training. At

Hibbert we offered 16 to 24 hours a week for training/tutoring, reflecting the business considerations of a smaller company on only one shift.

IX. DISSEMINATION PRACTICES

Because workplace education is so necessary in our area and in the nation, the project director disseminated information about opportunities for providing this program to other companies at 6 national, state, and local conferences. They included: PADE Conference (Pennsylvania Adult Developmental Education); NJADE (New Jersey Adult Developmental Education) where the staff and project director presented; NJALL (New Jersey Association for Lifelong Learning); Kentucky Workforce Conference; Network Conference in Baltimore (consortium for two-year colleges); International Management Association in New Jersey; and Mercer County Community College Business Breakfast; In addition, the project director presented testimony for the New Jesery adult literacy council, which resulted in being asked to participate in the Council's activities to develop recommendations for New Jersey's statewide long-range plans for adult literacy.

In addition, the program was described in newspapers, magazines and on television. *The New York Times* ran an article describing the benefits of a workplace education program for both employers and employees, and discussed how to access this type of program. (See Appendix). The *Trenton Times* and the *Trentonian* newspapers also had coverage about this program. An article for NAPL (National Association of Printers and Lithographers) *Printing Manager Magazine* provided ways for other businesses to become involved in workplace education Because of this publicity, two different PBS television stations featured the project on their television shows. The first program was a 6 minute documentary about the program which included classroom demonstration, partner comments and organizational information. The second show was a live interview with an employee/student, the project director, and two television interviewers. This eleven minute segment was broadcast in the tri-state area and focused on the benefits to workers and their companies.

The

X. MONTH BY MONTH PLAN OF OPERATIONS

A complete month-by-month plan of operation was developed by Mercer County Community College for Trane and Hibbert. A sample of major milestones and key activities during each month of the project follows:

All tasks were completed on schedule successfully

September:

- Convene partners and finalize details of operational plan
- Form and convene advisory group
- Conduct job-specific curriculum and assessment workshop
- Education and business partners meet to finalize training plans, conduct support services needs assessment

October

- On-site observation and interviews to develop needs assessment information, instructional strategies and finalize assessment tool selection
- On-site observations to provide technical assistance for curriculum and assessment development
- Administer placement tests for norming purposes with sample of workers in targeted job classifications
- Set worker productivity, retention and advancement objectives
- Develop and design record keeping forms for project monitor

November

- Conduct DACUM training sessions utilizing results of literacy audit
- Finalize plans for conducting assessment and individual educational plan developed
- Complete curriculum development

- Complete orientations and academic advisement and placement sessions

December

- Begin workplace literacy instruction
- Partners begin project record-keeping
- Evaluation team begins bimonthly technical assistance/formative evaluation visits

December 1992-February 1994

- Continue instruction and progress monitoring
- Continue technical assistance
- Develop learner job performance evaluation methods

February 1993 and February 1994

- Advisory council meetings to review project progress and plan follow-up activities

January and February

- Conduct post tests and assessments
- Gather learner productivity/job performance data

January and February

- Continue instruction
- Analysis of learner out-comes data, job specific program assessments, individual education plan accomplishment, changes in productivity, etc.
- Continue instruction

February

- Prepare learner progress and project evaluation report
- Finalize job specific workplace literacy modules
- Continue instruction

May 1994 (90 days)

- Submit project final report to Department of Education to include:
    - job specific workplace literacy curriculum modules
    - learner outcomes evaluation
    - service delivery model
    - guidelines for evaluating literacy
    - final evaluation report

XI. CURRICULUM

The project developed eighteen core curriculum which can be adapted for other similar industries. All company specific material were removed and replaced with more generic content. The protocol for each class consisted of hand-on, work related dialogues, team work, case studies, and reinforcement activities relating to the weekly content. Students were encouraged to work together, simulating the business environment where employees work in teams to maintain a just-in-time-work flow. Curriculum reflected the need to value each other's ideas, and to contribute to the group's activities while emphasizing basic skill and critical thinking development.

SAMPLE LESSON

MATH LAB ◆ SESSION 9

OBJECTIVES:

Upon completion of this session, students will be able to:

- read a pay check

TOPICS:

- reading a pay check

METHOD:

- discussion
- completion of worksheets

EVALUATION:

- self evaluation based on worksheets

MATERIALS:

- handouts: Problem Solving

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PAYCHECK

GROSS PAY **OTHER DEDUCTIONS**

Description	Hours	Amount	Description	Amount	YTD Amount	**Empl. No.** 20331
Regular	40.00	8.90	Unemp-Tax	15.30	76.50	**Soc. Sec. #** 124-55-3385
			Medical	14.53	72.65	**Week Ending** 2/4/94
			401K Invst.	9.48	47.40	**Check Date** 2/9/94
Gross Wage		356.00			1780.00	**Check No.** 7364

CURRENT INFORMATION

Gross Pay	Fed. W/H Tax	F.I.C.A.	State Tax	City/ County Tax	Total Other Deduct.	**NET PAY**
356.00	89.75	31.78	14.93	N/A	39.91	179.63
1780.00	448.75	158.90	74.65	N/A	196.55	901.15

YEAR TO DATE

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PAYCHECK

GROSS PAY			OTHER DEDUCTIONS			
Description	Hours	Amount	Description	Amount	YTD Amount	**Empl. No.**
Regular Gross Wage			Unemp-Tax Medical 401K Invst.			**Soc. Sec. #** **Week Ending** **Check Date** **Check No.**

CURRENT INFORMATION

Gross Pay	Fed. W/H Tax	F.I.C.A.	State Tax	City/ County Tax	Total Other Deduct.	**NET PAY**

YEAR TO DATE

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PAYCHECK

This is a **sample paycheck stub** but as you can see, not all of the information is on the check. Look at the information provided about this employee and write it in the paycheck stub in the correct places.

$ This paycheck belongs to **Karen Hopkins.** Karen's social security number is 223-57-8694. Her employee number is 20344.

$ This week, Karen worked her regular 40 hours per week. Her gross wage is 8.75 per hour. What would her gross total week's pay be?

$ So far this year, Karen's gross income is $5600.

$ The check number is 7387.

$ The company takes out for unemployment tax and this week they took out $11.24. So far this year, they have taken out $179.84.

$ The pay period ends 4/23/93. The check will be dated for a week later.

$ For Medical insurance, the company takes out $21.15 for each paycheck, and so far this year has taken out $338.40.

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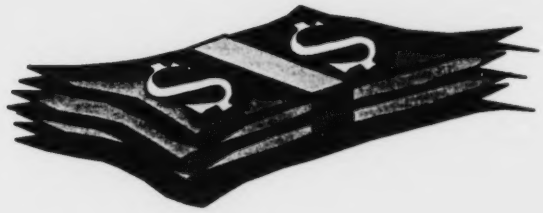
PAYCHECK



$ Karen has a 401K Investment through the company, also. This check they took out $43.66. So far this year Karen has set aside $698.56 into that investment.

$ The Federal Government withholds $57.89 from every one of Karen's paychecks. They have withheld $926.24 so far this year.

$ Karen has money taken out for Social Security. This paycheck they took out $20.34 so far. So far this year they have taken out $325.44.

$ The State also takes out taxes from Karen's check. Every week they take out $12.01. So far this year they have taken out $192.16.

$ $ BONUS questions of the day !!!! $ $

$ What was the *total* of her **deductions**?

$ What was Karen's **NET PAY** for this paycheck?

$ This is week 16 of the year. What is Karen's **NET PAY** *for the year so far*?

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APPENDIX

CURRICULUM

SERVICE
INDUSTRY

CURRICULUM DEVELOPMENT

from

DACUM

WRITING

Dacum	Uses	Skills	Location
WRITING	Forms: bag tags, time cards, location sheets, work orders, postal records, logs, unload slips, delivery receipts	• recognize subject and purpose of forms • place information in correct locations • evaluate written responses	
	Notes, minutes, reporting information	• identify subject, main ideas and support • know purpose and audience • organize ideas into the most effective order • transcribe notes into report form • write clearly and correctly • edit and evaluate copy	

	Memos, suggestions	• identify subject, main ideas, and support • know purpose and audience • adjust style and tone • organize ideas into the most effective order • use standard memo format • apply principles of good business writing (grammar, spelling, punctuation) • edit and evaluate copy	
	Letters: to customers, internal	• identify subject, main ideas, and support • know purpose and audience • adjust style and tone • organize ideas into the most effective order • use standard letter format • apply principles of good business writing (grammar, spelling, punctuation) • edit and evaluate copy	

READING
SKILLS

READING	Signs, symbols, diagrams, maps, charts and graphs; safety and location.	• interpret symbols and abbreviations in the workplace • skim and scan • identify the parts of maps, diagrams and flowcharts • follow and give instructions • summarize • evaluate	
	Forms: pick sheets, delivery slips, discipline action, time cards, pay stubs, bills of lading, postage records, requisitions, sorting charts, jackets	• identify unfamiliar vocabulary • know subject and purpose of forms • skim and scan • identify required and optional information • summarize • evaluate	
	Instructions (safety, on the job, department and company procedures); directions (how to)	• identify unfamiliar vocabulary • preview • skim and scan • know subject and purpose of instructions • identify materials, warnings, and notes for instructions • identify order of steps • summarize • evaluate • generate own instructions for others to follow	

	Notices, memos and letters: job postings, customer letters, internal communications	• identify subject, main idea and support • identify unfamiliar vocabulary • know purpose • separate facts from opinions • evaluate information • take appropriate action	
	Company policies and employee benefits	• identify subject, main idea and support • identify unfamiliar vocabulary • know purpose • evaluate information • take appropriate action	
	In-house and external literature (newsletters, brochures, papers, etc.)	• identify subject, main idea and support • identify unfamiliar vocabulary • know purpose • separate facts from opinions • evaluate information • take appropriate action	

SPEAKING SKILLS

SPEAKING SKILLS	Giving and receiving instructions	• speak clearly • identify purpose and audience • interpret steps • identify materials, warnings, and notes • evaluate responses • listen for key words and phrases • use appropriate visuals	
	Handling disputes	• identify problem • describe problem • generalize problem • identify individuals involved • devise strategies for solving problem • take appropriate action • evaluate	
	Team building to resolve problems	• identify problem • describe problem • generalize problem • identify individuals involved • brainstorm to devise strategies for solving problem • reach consensus among members • take appropriate action • evaluate	
	Active listening		

	Talking at meetings and in formal situations: talking in front of an audience (impromptu and prepared)		
	Speaking clearly		

MANUFACTURING INDUSTRY

CURRICULUM DEVELOPMENT

from

DACUM

WRITING

Uses	Skills	Location
Forms: job applications, logs, long term forms, work orders, travel cards, personnel and benefit forms	• recognize subject and purpose of forms • place information in correct locations • evaluate written responses	
Notes, meeting minutes, reporting information, meeting agendas	• identify subject, main ideas and support • know purpose and audience • organize ideas into the most effective order • transcribe notes into report form • write clearly and correctly • edit and evaluate copy	
Memos, suggestions	• identify subject, main ideas, and support • know purpose and audience • brainstorm • adjust style and tone • organize ideas into the most effective order • use standard memo format • apply principles of good business writing (grammar, spelling, punctuation) • edit and evaluate copy	

Letters: to customers, internal	• identify subject, main ideas, and support • know purpose and audience • brainstorm • adjust style and tone • organize ideas into the most effective order • use standard letter format • apply principles of good business writing (grammar, spelling, punctuation) • edit and evaluate copy	
Articles for Union and Just In Trane Newsletters; reports on team meetings	• identify subject, main ideas, and support • know purpose and audience • gather information • brainstorm • adjust style and tone • organize ideas into the most effective order • use standard letter format • apply principles of good business writing (grammar, spelling, punctuation) • edit and evaluate copy	

READING

Uses	Skills	Location
Bar charts, diagrams, and line graphs: blueprints, process sheets, station breakdowns, part numbers, travel cards, vouchers Maps: plant maps, fire alarm system maps Equipment: gauges, numbers on machinery, micrometers, calibrations on tools, scales,	• interpret symbols and abbreviations in the workplace • skim and scan • identify the parts of maps, diagrams and flowcharts • follow and give instructions • summarize • evaluate	
Forms and labels: chemical labels, Kanban cards, paychecks, travel cards, job postings, discipline action forms, personnel and benefits forms, cafeteria menu	• identify unfamiliar vocabulary • know subject and purpose of forms • skim and scan • identify required and optional information • summarize • evaluate	
Instructions (safety, on the job, department and company procedures): equipment instructions, MSDS sheets, repair orders, line procedures, product literature	• identify unfamiliar vocabulary • preview • skim and scan • know subject and purpose of instructions • identify materials, warnings, and notes for instructions • identify order of steps • summarize • evaluate • generate own instructions for others to follow	

Notices, memos and letters: job postings, customer letters, internal communications (safety reports), written rules and regulations	• identify subject, main idea and support • identify unfamiliar vocabulary • know purpose • separate facts from opinions • evaluate information • take appropriate action	
Company policies and employee benefits, Union rules, contract	• identify subject, main idea and support • identify unfamiliar vocabulary • know purpose • evaluate information • take appropriate action	
In-house and external literature: Just in Trane Newsletter, Union Newsletter	• identify subject, main idea and support • identify unfamiliar vocabulary • know purpose • separate facts from opinions • evaluate information • take appropriate action	

SPEAKING SKILLS

Uses	Skills	Location
Giving and receiving job task instructions; verifying equipment with set-up people	• speak clearly • identify purpose and audience • interpret steps • identify materials, warnings, and notes • evaluate responses • listen for key words and phrases • use appropriate visuals	
Handling disputes; management and union negotiation; communicating constructively with supervisors, management, and co-workers	• identify problem • describe problem • generalize problem • identify individuals involved • devise strategies for solving problem • take appropriate action • evaluate	
Team building to resolve problems and build consensus	• identify problem • describe problem • generalize problem • identify individuals involved • brainstorm to devise strategies for solving problem • reach consensus among members • take appropriate action • evaluate	

Active listening	• focus on speaker and subject • analyze and clarify information • give appropriate response to continue dialogue • evaluate conclusion of dialogue	
Talking at Team and Union meetings; at formal situations (prepared)	• identify topic • know purpose and audience • adjust style and tone • research material • organize materials • practice • manage performance anxiety • present material • use good speaking skills • evaluate performance	
Impromptu speaking: question and answer sessions, Working Classes	• organize thoughts • use PREP formula • manage performance anxiety • use good speaking skills • evaluate performance	

PERSONAL AWARENESS

Uses	Skills	Location
Stress management	• recognize stress in self • learn to reduce/control stress • practice a variety of relaxation techniques • generalize skills learned to combat job stressors and personal stressors • consider/identify emotional factors • utilize techniques on the job and in personal life	
Time management	• identify good time-use habits • consider/compare current time-use skills • create action plan for more efficient time planning	
Communication skills	• understand self • listen actively • promote dialog • communicate during conflict through to resolution	
Problem solving	• learn step by step process • incorporate good communication techniques • think critically • make decisions	

COURSE OUTLINES

BASIC BLUEPRINT READING

COURSE OUTLINE:

Blueprints will be a part of everyone's job in the future. Learn how to read, understand and use the tools necessary to read a blueprint, and how to use blueprints in your work. There will be hands-on activities using the T-square, micrometer, 6 inch rule, tape measure, dial caliper and torque sensor to read blueprints. There will be a review of the math required for blueprint reading.

OBJECTIVES:

Upon completion of this course, students will be able to:

- use tools required to read blueprints
- explain the principals used in blueprint drawing
- sketch simple blueprints
- interpret blueprint specifications used on the job
- complete mathematical problems required for blueprint reading

TOPICAL OUTLINE:

- scope of blueprint reading
- measurement and dimensions, including measurement tools and math
- hands-on experience with company blueprints
- review

BUSINESS WRITING

COURSE OUTLINE

In order to communicate effectively in the modern office, we need to be able to write clearly and persuasively. This course presents the fundamentals of effective business letter writing. It will focus on logical organization, word choice, style, tone and clarity, using students' own examples as well as practice exercises for reinforcement.

OBJECTIVES

Upon completion of this course, students will be able to:

- analyze why complicated memos and letters fail to get their message across
- identify the reason for writing
- analyze the reader and what his response should be
- choose appropriate styles and tones
- organize ideas into the most effective order
- apply the principles of good business writing, including grammar, punctuation and mechanics
- edit first drafts
- write clear, precise letters and memos

TOPICAL OUTLINE

- analyzing the author's purpose, the reader, the style and tone
- prewriting - brainstorming, organizing, freewriting
- writing clearly and correctly
- editing

COMMUNICATING ON THE JOB

COURSE OUTLINE:

Problems at work occur when there are blockages to communication. This course will look at how we communicate in a verbal and non-verbal manner, in writing, formally and informally, and will give students strategies to communicate more effectively.

OBJECTIVES:

At the end of this course students will be able to:

- identify who they communicate with and how
- identify different personality types and behaviors
- recognize their own style of communicating
- identify and use positive body language
- identify and avoid negative body language
- use active listening strategies
- use strategies to resolve conflict and problems
- work towards consensus and group decision making
- organize and present ideas verbally and in writing
- use principles of good business writing
- distinguish different writing styles for different audiences
- edit their writing

COMMUNICATING ON THE JOB

TOPICAL OUTLINE:

- What is communication?
- Personality types and behaviors
- Verbal and non verbal communication
- Active listening
- Conflict resolution
- Problem solving
- Organizing and presenting ideas
- Working towards consensus and group decision making
- Organizing and presenting ideas
- Principles of good business writing
- Analyzing the author's purpose, the reader, style and tone
- Editing

OTHER:

Hours: 18
CEU: 1.8

DOCUMENTATION

COURSE OUTLINE:

Session 1

- General principles of procedure writing
  - what is goal? purpose?
  - what is the best method for getting instructions across?
    standardized style:
    active voice, strong verbs, subject/verb agreement, tense consistency, clear pronouns, clear time words
  - sequence/complete instructions – keep sequence consistent

- Students will write their own instructions for something they do at work, e.g. getting into Word for Windows

Session 2

- principles of clear communication: clarity/audience/visualize
  assume audience is a raving bunch of neophytes –
  - particular attention on what questions the audience would need to have answered
  - generate student list of *questions* and concerns
  - visuals: screen samples, diagrams

- identification of system types/accounts/customer requests
  - generalizations?
  - standardized approaches?
  - client profiles – questions generated to standardize approach (what questions would you ask if you were asking about a new client or new system)

DOCUMENTATION

Session 3

- working with examples/fixing bad documentation
  - lack of clarity – ambiguous phrases, misplaced modifiers, unclear pronouns
  - incomplete steps – steps missing, steps not clear, sequence not given
  - poor profiles – fragments missing

Students will work in pairs on worksheets and on a sample of bad documentation (short) written by us – then they will critique each other's work

Session 4

- good/bad documentation
  - generate list of comparison/contrast from students: what makes good/bad documentation? (clarity, user friendliness, consistent style, good and clear sequence, visuals)

Students will work in pairs on exercises that apply these concepts – bad documentation sample from Michelle

Session 5

- students write their own documentation

Session 6

- Students critique each other's work and give feedback

ESL 1 ◆ MANUFACTURING

COURSE OUTLINE:

Accent on English

Identifies English problems for non-native speakers. Encourages students to practice speaking, writing, listening, and reading skills using company literature such as procedures, lists, policies, and safety information. Provides strategies for students to improve pronunciation, sentence structure, verb tenses, American idioms, and work vocabulary.

OBJECTIVES:

Upon completion of this course, students will be able to:

- Ask grammatically correct questions in various tenses
- Give grammatically correct answers in various tenses
- Ask for and understand oral instructions
- Read and use the literature in the workplace
- Communicate effectively with co-workers
- Build a working English vocabulary for the workplace and beyond

ESL 1 ◆ MANUFACTURING

TOPICAL OUTLINE:

- Simple present tense
- Present progressive tense
- Modal "should"
- "Going to" and "It takes me"
- Cardinal and Ordinal Numbers
- Nouns and Pronouns
- Prepositions
- Definite and Indefinite articles
- Commands for giving instructions
- MSDS sheets and safety vocabulary
- Role plays: introducing yourself and others; asking for information; reporting information and incidents; implementing safety rules and disciplinary procedures; asking for and giving instructions
- Work vocabulary
- Work literature: station breakdown; instructions; color codes; MSDS sheets; disciplinary and safety policies
- Team building activities: brainstorming, building consensus, and problem solving
- Critical language skills: dialogues; surface language vs. real language; idioms; registers

EVALUATION:

- Students will be evaluated for written and spoken language skills with interviews and analysis of pre and post-tests
- Improvement in learning techniques will be evaluated based on performance in class and on worksheets
- Students will perform self-evaluations based on correct completion of worksheets

EVALUATION APPLICABLE IN THE WORKPLACE:

At the end of this course, students will perform more effectively in the workplace:

- Students will be more competent at number use and discrimination. This competency will reduce the number of job errors that revolve around the use of travel cards, part numbers, breakdowns, and rates.

- Students will be more effective communicators in that they will be able to use correct verb tenses and time expressions, which will reduce the occurrence of misunderstanding or miscommunication.

- Students will be more adept at giving and receiving instructions, both written and oral. This will enhance their ability to perform jobs on the line and make fewer errors in completion of those tasks.

SOURCES:

Rubin, Betsy. *Grammar Write Away: Book I.* Chicago: Contemporary Books, 1990.

ESL 2

COURSE OUTLINE:

Accent on English

Identifies English problems for non-native speakers. Encourages students to practice speaking, writing, listening, and reading skills using company literature such as procedures, lists, policies, and safety information. Provides strategies for students to improve pronunciation, sentence structure, verb tenses, American idioms, and work vocabulary.

OBJECTIVES:

Upon completion of this course, students will be able to:

- Ask grammatically correct questions in various tenses
- Give grammatically correct answers in various tenses
- Ask for and understand oral instructions
- Read and use the literature in the workplace
- Communicate effectively with co-workers
- Build a working English vocabulary for the workplace and beyond

ESL 2

TOPICAL OUTLINE:

- Simple past tense
- Simple future tense
- Past progressive tense
- Expressing agreement and disagreement
- Comparatives and Superlatives
- Count and noncount nouns
- Phrasal verbs and object pronouns
- Role plays: asking to borrow tools and equipment, reporting incidents in the workplace, asking for information regarding an incident, asking for and giving directions, calling in sick/late, making a doctor's appointment
- Work vocabulary: tools, safety
- Work literature: company map, instructions, company policies as posted, team building materials

EVALUATION:

- students will be evaluated for written and spoken language skills with interviews and analysis of pre and post-tests
- improvement in learning techniques will be evaluated based on performance in class and on worksheets
- students will perform self-evaluations based on correct completion of worksheets

MAKING THE MOST OF YOUR WORK DAY

COURSE OBJECTIVES:

- Analyze one's daily routines
- Understand the effect one's mental attitude has on productivity
- Learn time management strategies
- Review communication skills that assist in efficient time use and productivity
- Identify and practice assertiveness skills
- Learn problem solving strategies that assist in efficient time use
- Identify stress management strategies
- Apply learning to suit individual needs

TOPICAL OUTLINE:

- Preparing mentally and physically for a productive day
- Time management techniques including:
    - ◊ prioritizing
    - ◊ delegating
    - ◊ personal prime time
    - ◊ getting organized
- Active listening
- Handling conflict
- Problem solving strategies
- Stress management

MATH ON THE JOB

COURSE OUTLINE:

This course is a review of basic number concepts focused on helping participants understand the meaning of numbers and arithmetic operations. Strategies are provided for increasing accuracy when doing computations with whole numbers, decimals and percents. Rounding, estimating and averaging is covered together with techniques for mental arithmetic. Applications to real work situations are used throughout with an emphasis on problem solving.

OBJECTIVES:

Upon completion of this course, students will be able to:

- read and write whole numbers and decimals using a place value chart
- perform basic operations involving whole numbers and decimals
- round numbers and estimate
- perform mental arithmetic
- solve proportions
- calculate per cents
- apply number concepts in problem solving situations
- read and interpret charts and graphs

TOPICAL OUTLINE:

- place value
- computations with whole numbers
- mental arithmetic
- rounding
- estimating
- averaging
- computations with decimals
- ratio and proportion
- per cent concepts
- problem solving

MATH ON THE JOB

OTHER:

- Hours: 24
- CEU: 2.4

SOURCES:

Mitchell, Robert. *Math Skills that Work, Book One.* Chicago: Contemporary Books, 1991.

MATH LAB

COURSE OUTLINE:

This course is a review of basic number concepts focused on helping participants understand the meaning of numbers and arithmetic operations. Strategies are provided for increasing accuracy when doing computations with whole numbers, decimals and percents. Applications to real work situations are used throughout with an emphasis on problem solving.

OBJECTIVES:

Upon completion of this course, students will be able to:

- read and write whole numbers and decimals using a place value chart
- perform basic operations involving whole numbers and decimals
- calculate per cents
- apply number concepts in problem solving situations
- read and interpret charts and graphs

TOPICAL OUTLINE:

- place value
- computations with whole numbers
- computations with decimals
- per cent concepts
- problem solving
- measurement

OTHER:

- Hours: 20
- CEU: 2.0

PRE-BLUEPRINT MATH

COURSE OUTLINE:

In order to read a blueprint accurately it is necessary to know how to calculate angles, convert fractions to decimals, measure accurately, and use the micrometer, 6 inch rule, protractor, and caliper. This hands-on math course gives you practice in the math skills you need before you take the blueprint course.

OBJECTIVES:

Upon completion of this course, students will be able to calculate using the following:

- decimals
- linear measurement
- common fractions and mixed numbers
- angular measurement

TOPICAL OUTLINE:

- Basic strategies for calculating decimals and mixed numbers
- Using machinists tools to calculate measurement
- Methods for calculating common fractions and mixed numbers
- Determining angles

PRESENTATION SKILLS

COURSE OUTLINE:

We need to be able to put forward our ideas clearly and persuasively. This course takes students through the process of presenting ideas, from preparing themselves and their materials to standing up and speaking in front of an audience.

OBJECTIVES:

Upon completion of this course, students will be able to:

- identify the traits of good and bad speakers
- brainstorm to select an appropriate topic
- research information
- organize information
- define objectives
- identify different audiences and situations
- identify purpose
- write presentation draft (introduction, support, conclusion)
- condense draft and transfer to notecards
- use strategies to relieve presentation stress
- practice presentation
- present
- give brief coherent impromptu presentations
- give and receive constructive feedback

METHODS:

- guided group discussions
- individual reading and writing
- constant use of video camera

OTHER:

This is a four week course, with two 2-hour sessions per week. The course was team taught by two full time staff members and one part time counselor. This method was particularly effective during the students' preparation stages where more individual attention was necessary.

PROBLEM SOLVING

OBJECTIVES:

- Describe and analyze problems encountered at work
- Write a problem statement
- Use an orderly, step by step process to solve problems
- Apply creativity to the problem solving process
- Use the brainstorming technique to help solve problems
- Become adept at using these techniques for all types of problems (work or personal)

TOPICAL OUTLINE:

- Defining a problem
- Guidelines for writing a problem statement
- Steps in problem solving
- Creative thinking
- People and problems
- Action plan for problem solving

METHODS:

- Discussion
- Working in small groups
- Roleplays
- Completing worksheets

EVALUATION:

- Verbal participation
- Completing worksheets
- Coaching/helping one another in skill development

READING 1 ◆ GETTING THE POINT

Information is all around us. This course provides strategies for finding and using the information you need to make the right decisions on the job and at home. Using real work situations, these sessions provide techniques to develop and use a reading plan, improve your vocabulary, and interpret, use and evaluate information in order to do your job better and solve problems.

OBJECTIVES:

Upon completion of this course, students will be able to:

- use a reading plan to skim, scan and read anything from labels to detailed instructions, memos, letters and reports
- apply strategies for dealing with unfamiliar vocabulary
- identify main ideas and supporting details of paragraphs, memos and reports
- research information
- use information to take appropriate action
- evaluate results

TOPICAL OUTLINE:

- developing a reading strategy
- using the strategy to read forms and memos at work
- how to deal with unfamiliar vocabulary
- identifying the subject, the main point and why the author wrote the article
- evaluating information and drawing conclusions
- reading for action
- case study

OTHER:

- Hours: 16
- CEU: 1.6

SOURCES:

Echaore-Yoon, Susan. **Reading Skills that Work Book 2.** Chicago: Contemporary Books, 1991.

Park, Rosemarie J., Olson, Rebecca L., Oldham Neild. **Reading for Workplace Success.** Eden Prairie, MN: Paradigm Publishing International, 1991.

Joffe, Irwin L. **Opportunity for Skillful Reading.** Belmont, California: Wadsworth Publishing Company, 1991.

READING LAB

COURSE OVERVIEW:

- Targeted Population: Non-readers through 5th grade
- Selection Process: TABE Test and individual tutor and counseling
- Group Size: Under 7

STRATEGIES FOR ADULT REMEDIATION:

- Build secure, constructive working relationships with adult learners through individual tutoring
- Individual tutoring for 6 weeks
- With student approval formed small class
- Classes intensive, targeted remediation combining peer work, individuals, whole group and computer
- Begin with what the employees are familiar with, then branch to work-related material
- Build a flexible, non-censoring environment and curricula
- Allow students to work at their own pace

DIAGNOSTIC MATERIALS:

- TABE
- Nadine Rosenthal's Diagnostic Phonics and Comprehension Assessment

READING LAB

MATERIALS:

- *New Beginnings in Reading* – Bonnie Tivenon, Contemporary Press, 19??.
- *EDL Reading Strategies* – Software
- *Tales of the Odd and Unexpected* –
- *"News For You" – New Readers Press*
- Various company material

METHODS:

- Expose Learners to as many types of reading as possible
- Combine reading strategies of phonetics, sight vocabulary and decoding
- Increase amount of student writing
- Use holistic approach –
    - ◊ First teacher write material, then have students copy
    - ◊ Finally students begin to write on their own
- Flexible group structure that allows peers to work together to solve common problems or individually to learn specific skill
- Build team support system
- Incorporate the basic skills such as homophones, spelling, grammar and writing simple phrases to paragraphs
- Incorporate daily work-related information and coping strategies to encourage worker to become more self-
- Build self-esteem and a sense of personal accomplishment by breaking complex materials into smaller segments.
- Encourage bonding through the small group environment

RESULTS:

Over two years increase in reading scores after 100+ hours of training

READING AND WRITING EFFECTIVELY

Words are all around us. We need to be able to understand the messages they give us and to use these words to communicate to others. This course will offer tips to interpret and use signs, notices, forms, memos, instructions, maps, diagrams and flowcharts.

OBJECTIVES:

Upon completion of this course, students will be able to:

- Recognize and use job terms
- Interpret symbols, abbreviations, and acronyms
- Apply strategies for dealing with unfamiliar vocabulary
- Use reading plan to skim, scan, and read anything from labels and signs to detailed instructions, memos, and articles
- Identify subjects, main ideas, and supporting details of paragraphs, memos and articles
- Follow and give instructions using diagrams, maps, and flowcharts
- Write summaries, paragraphs, and instructions
- Research information to solve a problem
- Use information to take appropriate action

TOPICAL OUTLINE:

- Job terms
- Abbreviations, acronyms, and pictorial symbols
- Sentence structure
- Vocabulary building
- Paragraphs
- Forms and memos
- Diagrams, maps, and flowcharts
- Case study

SOURCES:

Echaore-Yoon, Susan. *Reading Skills that Work: Book I.* Chicago: Contemporary Books, 1991.

OTHER:

- Hours: 32
- CEU: 3.2

READING AND WRITING II

COURSE OUTLINE:

Words are all around us. We need to be able to understand the messages they give us and to use these words to communicate to others. This course will help you interpret and use abbreviations, instructions, forms, graphs, charts, tables, indices, and directories.

OBJECTIVES:

Upon completion of this course, students will be able to:

- recognize and use job terms
- interpret abbreviations and acronyms
- categorize information
- list and prioritize criteria for decision making
- use a reading plan to skim, scan, and read workplace material such as detailed instructions, schedules, graphs, tables, charts, and directories
- generate visual representations of information (charts,
- graphs, tables)
- use an index to find information
- spell with greater confidence and accuracy
- write summaries, paragraphs, and instructions
- research information to solve a problem
- use information to take appropriate action
- plan and carry out a group project

TOPICAL OUTLINE:

- abbreviations and acronyms
- reading strategy
- vowels and spelling problems
- categories
- comparison/contrast techniques
- tables, graphs, charts
- team project

SOURCES:

Echaore-Yoon, Susan. **Reading Skills that Work: Book I.**
Chicago: Contemporary Books, 1991.

OTHER:

- Hours: 32
- CEU: 3.2

STRESS MANAGEMENT

COURSE OUTLINE

◆It's a simple fact: People who accept and adapt to change experience less stress.◆

Session I

1. Learning to recognize good and bad stress in yourself
   a) physical, emotional/psychological and physiological aspects
2. Learn about relaxation techniques
3. Make a plan of action and DO IT

Session II

1. Review relaxation techniques and how used during the week
   Emphasize "practice" needed
2. Communication habits that can increase stress
3. Learning communication techniques that can help break down your stress
4. Practice techniques in role play
   a) plan action – DO IT

STRESS MANAGEMENT

Session III

1. Review relaxation and communication techniques - how used during the week? Emphasize "practice"

2. Recognize ways to reduce stress through:
   a) proper nutrition
   b) exercise
   c) planning/using time better

3. Small group activity to "ground" learning

4. Review need to:
   a) recognize your response to stress
   b) choose your plan of action
   c) DO IT (keep practicing)

☎ *TELECOMMUNICATIONS* ☎

The telephone is one of the most important business tools. The way you handle calls determines whether you create business or lose it. This course will help students improve their telephone techniques, maintain a positive attitude, and listen actively to their customers' needs. Using role plays, the tape recorder, worksheets and class discussion, students will get many opportunities to practice these skills.

OBJECTIVES:

At the end of this class, students will be able to do the following:

- use professional answering skills
- use effective listening skills
- recognize different caller behaviors
- recognize different types of calls
- handle difficult callers
- respond to the caller's needs
- screen and transfer calls
- return customer calls promptly
- solve caller problems to the best of their ability

TOPICS:

- answering techniques
- question techniques for gathering information
- effective listening
- caller behaviors
- types of calls
- returning calls
- handling difficult callers
- transferring calls

WRITING 1 MAKING THE POINT

COURSE OUTLINE:

We need to communicate our ideas to others with brief, clear and complete messages. This course will provide strategies for presenting your ideas clearly and accurately to your reader. During these sessions you will learn tips to apply the principles of good business writing to any writing you may do at work and at home.

OBJECTIVES:

Upon completion of this course, students will be able to:

- analyze why complicated memos and letters fail to get their message across
- identify the reason for writing
- analyze the reader and what his response should be
- choose appropriate styles and tones
- organize ideas into the most effective order
- apply the principles of good business writing, including grammar and punctuation
- edit first drafts
- respond to problems at work and take appropriate action in writing
- write clear, precise letters and memos

WRITING 1 MAKING THE POINT

TOPICAL OUTLINE:

- analyzing the author's purpose, the reader, the style and tone
- prewriting - brainstorming, organizing, freewriting
- writing clearly and correctly
- editing
- using writing when solving problems

OTHER:

- Hours: 32
- CEU 3.2

SAMPLE ORIENTATION HANDOUTS

SAMPLE FLYERS USED FOR AN ORIENTATION PROGRAM

SKILLS FOR TOMORROW NOW

WE ARE HERE FOR YOU!!!!

- An opportunity for training
- Free of charge
- Right here at (CO. NAME)
- On Company time
- Choice of many different courses

TOO GOOD TO BE TRUE????

The Federal Government gave $$$ to Mercer County Community College for the next 15 months to train employees to refresh and update their skills.

WHO CAN COME????

The first set of courses will be for the Quality Operators. Your co-workers **Robert Blair, Mary Ann Gallagher, Shirley Holmes, Joseph Loncosky, Pat Mazotas, Vicki Skorut, Fran Venturino and Forrest Willis** spent many hours with us in the early planning stages. As time goes on courses will be developed for other groups of employees, also.

WHAT ARE THE PRESIDENTIAL CANDIDATES AND GOV. FLORIO SAYING ABOUT PROGRAMS LIKE THIS?

THE AMERICAN WORKER MUST STAY UPDATED, SKILLED AND COMPETITIVE WITH FOREIGN MARKETS.

HERE IS YOUR CHANCE TO:

- Refresh and update your skills in communications and math
- Increase your current job knowledge
- Take courses to prepare you for the ever-changing technology
- Be ready to be "job smart" as machines get smarter

WHO WINS?

- *(CO.)* wins with more skilled employees
- *You* win by refreshing and updating your skills
- *Your family and community* win with your new knowledge

WHAT WILL IT BE LIKE????

Friendly, helpful teachers
Most classes will meet twice a week, 2 hours each time
No grades
Homework is optional
No "reporting back" to supervisors on employees
Attendance records will be given to supervisors

WHAT SHOULD YOU CHOOSE????

Come plan your individual course needs with our counselor, **Ave Pollak** for December and over the 15 months of our partnership. Sign Up to meet with Ave to discuss what YOU want to take.

COURSE DESCRIPTIONS

Take time to read our course descriptions and consider which classes you will choose. Then meet with our counselor Ave Pollak who will help you plan your courses.

1. **GETTING THE POINT:** How to make better use of the information people want you to have about your job and your world.

Your company, your family and your representatives depend on you. This course will offer you reading techniques for finding and using the information you need to make the right decisions on the job and in your neighborhood. Using real life situations from your work and your neighborhood, these sessions will show you how to: skim, scan and read anything from labels to detailed instructions, memos, reports and manuals.

2. **MAKING A POINT:** How to deliver brief, clear and complete messages to your boss, co-workers, family and neighbors..
Your company, your family and your community need your ideas. This course will offer you writing tips for presenting your ideas clearly and usefully . Using real life situations these sessions will show you how to: put your ideas on paper and write clear and correct sentences.

3. **WORKING IN ENGLISH**: Make English "work" for you at work and at home. This course will help you focus and work on your particular problem in speaking to writing in English. These sessions will help you in pronunciation, forming sentences and vocabulary.

4. **AT WORK , AT HOME WITH NUMBERS**: Increase your comfort level and accuracy with numbers and units of measurement.
Numbers are everywhere at and at home. Here is a chance to learn to: refresh your speed and accuracy with addition, subtraction, multiplication and division, use a calculator, read lists of numbers with accuracy, and estimate size and number.

5. **STRESS: Dealing with the pressures of job, home and family**
This course will focus on the sources and symptoms of stress at work and at home. Techniques for managing stress, creating balance in your work life and home life and keeping stress at a minimum.

6. **PROFIT AND PRODUCTION AT : How each employee contributes.**
This course will address the positive flow of quality products by a skilled workforce to customer service and satisfaction taking situations from real life and the work place to explain economic principles at . You will learn what $ is, how companies get it and use it, what runs your company, what reduces costs and raises profits and how you fit in.

Take advantage of this outstanding offer from /Mercer County Community College(MCCC). We look forward to sharing this great opportunity with you.

FILL OUT THE FORM BELOW, TEAR OFF AND RETURN IT TO: PERSONNEL (We have a drop box there)

Check courses you would like to take.

NOTE: Each employee will be scheduled for one course a session. Your other choices will be kept on file and you will have the opportunity to take these courses at a later date.

Ave Pollak, our counselor, will help you schedule your choices. A sign-up schedule will be posted.

Courses:

_____1. Getting the point: How to make better use of the information people want you to have about your job and your world.

_____2. Making a point: How to deliver brief, clear and complete messages to your boss, co-workers, family and neighbors.

_____3. Working in English: Make English "work" for you at work and at home

_____4. At work, at home with numbers and measures

_____5. Stress: dealing with the pressures of home and family

_____6. Production and profit: How each employee contributes

Name:_____

SS# _____

Dept./Shift_____

Courses_____

Signature: _____

SAMPLE SCHEDULE

Sample Schedule

SKILLS 2000

Summer Session 1

June 7-July 22, 1993

Time/Date	Monday	Tuesday	Wednesday	Thursday	Friday
9:00 a.m. - 10:00 am	Reading Workshop- Lorna	WORKING (COMPANY TRAINING) 8-10	WORKING 8-10	WORKING 8-10	WORKING 8-10
10:15 a.m. to 12:15 p.m.	Presentation Skills Carol/Lorna	Math Lab Pat		Math Lab Pat	
11:00 a.m. - 1:00 p.m.			11-1 Presentation Skills Carol/Lorna		
1:00 p.m.- 3:00 p.m.	ESL Workshop Carol	Problem Solving Techniques Workshop Ave	ESL Workshop Carol	Reading on the Job Lorna	Reading Workshop - Lorna
3:00 p.m.- 4:30 p.m.		3:30 - WORKING			
3:00 p.m. - 5:00 p.m.	Math Lab -2nd shift Pat		Reading on the Job- -2nd shift Lorna	Reading on the Job- -2nd shift Lorna	Math Lab - 2nd shift Pat

SAMPLE SURVEY

Supervisor Evaluation Form
Midterm
Skills 2000

Now that we have reached midterm in the training, we again turn to you for your opinions and suggestions to make the training program more valuable to your unit personally, to the company, and to your employees. Please fill out this questionnaire and return it to **Ron Rago or Gary Brasseur by August 6th. Thank you for your help.**

Questionnaire

1. How many employees from your area participate in training? ____

Please check (√) **Yes** or **No** for each question.

	Yes	No
2. Has their attitude towards work improved?	____	____
3. Do they offer assistance to other employees?	____	____
4. Do they volunteer for other or additional duties?	____	____
5. Can they follow directions more easily?	____	____
6. Are they able to communicate problems or information more easily?	____	____
7. Are they more confident communicating with you or co/workers?	____	____
8. Are there less reworks in his/her area?	____	____
9. Has his/her attendance/punctuality improved?	____	____

10. Our courses try to give work-related instruction. Are there other areas you feel we need to cover to help your area better? (Ex. -communication)

_____
_____
_____

Name _____ Department _____

Research Areas

Skills 2000/Skills for Tomorrow-NOW

Business Outcomes	Education Outcomes
• Employee empowerment	= communication skills
• Attendance before, during classes, after morale	= increased confidence,
• Safety	= directions
• Per unit production	= accuracy
• Lower error rates	= better communication and teamwork
• Reduced management time	= communication, directions
• # of product defect pre and post program	= details/directions, etc.
• Quality measurements??	= reading, math, etc.
• Increased on-time shipment orders	= details
• Positive customer feedback	= customer service, team building
• Improved morale	= attention from program
• Reduced turnover	= more skills
• Reduced waste	= accuracy
• Promotions	= skills
• Improved safety in non-English speakers	= Improved ability to communicate in English
• Volunteering for team activities	= teamwork, communication
• Bidding out on other jobs	= increased confidence and ability

- How long do these changes last with, and without training
- How does the number of hours per training affect the outcomes
- Other company standards for growth
- Other company standards for accuracy/success

SAMPLE GRADUATION CEREMONY PROGRAM

Skills For Tomorrow
C.E.U. PRESENTATION CEREMONY

The HIBBERT Group
Mercer County Community College

June 1993

Welcome:	Ted Brown	President
	Diane Allen	VP Human Resources
	Jim Balara	Sr. VP Operations
	Al Madeley	VP Production
	Marty Reed	Plant Manager-Corporate
	Joe Salonia	Plant Manager-Service
Remarks:	Elaine Weinberg	Dir. Workplace Skills Project MCCC

Presentation of C.E.U.s:

Lorna Burt	Instructor, MCCC
Carol Lewandowski	Instructor, MCCC
Ave Pollak	Instructor/Counselor, MCCC

SAMPLE STAFF DEVELOPMENT

Mercer County Community College

Center for Training and Development

TRAIN THE TRAINER PROGRAM

Instructor: Nunzio E. Cernero

TRAIN - THE - TRAINERS

As a result of this workshop, participants will be able to:

- Describe the components of an effective presentation
- Prepare for a presentation
- Develop a presentation
- Use presentation methods
- Use presentation skills
- Deliver an effective presentation

TRAIN - THE - TRAINERS

Objective

As a result of this workshop, participants will be able to:

- Describe the components of an effective presentation

Outline

- Purpose of a presentation
- Presentation situation model
- Barriers to effective presentations
- Components of an effective presentation:
  -- Design
  -- Methods
  -- Skills
- Conclusion
  -- Review
  -- Evaluation

SAMPLE IEP

SKILLS FOR TOMORROW NOW

Individual Education Plan

Name _____

Date _____

Current job _____

Length of time on this job _____

Previous job _____

Do you have a high school degree? _____

If not, what was your last grade? _____

If not, would you like to receive it? _____

What was high school like for you? _____

_____

What do you consider to be your strengths as a learner? Your weaknesses? _____

_____

What skill or subject do you most want to learn? _____

_____

What are your future goals for your job at Hibbert? _____

_____

What educational requirements are necessary for this new position? _____

_____

What educational requirements do you need for your current job that you would like to get from the Skills Program? _____

_____

What is the most difficult part of your job for you? _____

_____

Courses available in Skills Program:

Reading:

Do you need to learn to:	YES	NO
• Develop techniques to read and spell basic words	___	___
• Develop techniques to read manuals more acurately and quickly	___	___
• Learn to understand vocabulary in context in order to read job materials	___	___
• Expand comprehension skills in job related reading material	___	___
• Develop skills for interpreting graphs and charts		

Math

Do you need to:	YES	NO
Math 1		
• Refine and review basic skills such as adding, subtracting, multiplying and dividing of fractions and decimals	___	___
• Learn to use the calculator	___	___
• Solve word problems	___	___
	___	___
• Compute ratios, proportion and percents	___	___
• Comprehend the fundamentals of statistics and probability	___	___
• Comprehend the fundamentals of geometry and elementary algebra	___	___

Science

Do you need to understand how basic machines work:	YES	NO
• Basic electicity	___	___
• Heating	___	___
• Air-conditioning	___	___

Writing

Do you need to:	YES	NO
• Develop skills for writing and editing memos, letters and reports	___	___
• Develop strategies to learn grammar and spelling	___	___

Problem Solving

Do you need:	YES	NO
• Tips and strategies for solving problems	___	___

Stress Management

Do you need:	YES	NO
• Tips for dealing with the daily stresses of work and home life	___	___

Why are you taking these MCCC course(s)?

_____

_____

At the end of the program, were these objectives met?

_____

_____

Recommendations:

Courses to Take		Timeframe
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____

SAMPLE NEWSPAPER ARTICLES

Education Becomes Lifelong Process

By Dorothy Fischer

Those unprecedented upheavals convulsing America's once sturdy and staunch employers, among them IBM, GM, Sears, even the United States Postal Service and state government, have shaken the confidence of the workforce.

In the aftershocks of this corporate carnage, both the unemployed and the shakily employed are heeding a certain gospel preached at Thomas Edison State College and Mercer County Community College, to wit, your education shouldn't end until you do.

"Life long learning is no longer a luxury or a little hobby," says Linda Holt of Edison. "It's essential now to stay informed of the latest developments in every field, and lifelong learning is something that's going to be part of our lives. You don't just graduate when you're 22 and forget about it. Things are changing too fast for that."

Dr. Thomas Sepe, head of Mercer County Community College, agrees. "The community at large must come to see education training and retraining as a lifetime process vital to both their working and private lives."

Anticipating numerous changes in the job market between now and the fast approaching 2000, Dr. Sepe believes that the college, because of its history and experience, "is in a strong position to provide many of the resources business and industry will require to adapt and grow according to the challenges and opportunities as they unfold."

The college is primed to help the present, future and displaced workforce in many ways. Spokesperson Marta Kaufmann points out that any of the college's courses can be delivered to businesses on-site. The college is involved in the Workforce Development Partnership project for employee training, and Workplace Literacy, a program that operates on various levels of sophistication. Partnership 2000 pairs the college with business and government in efforts to keep the county's workforce competitive.

Kaufmann adds that the college will train employees to specific, customized manuals. Other programs are geared to upward mobility training, short-term training, and small business start up and retention. The school features economic development packets for business recruitment,

Robotic arm used in computer integrated manufacturing technology program at Mercer County Community College.

and handles international software. A total of 53 two-year career programs are offered as well as 23 transfer-sharing resources.

Elaine Weinberg heads the school's Workplace Skills Project which operates under a grant from the United States Department of Education. This is an on-site program to help develop work skills among the entire workforce of participating companies, from maintenance to clerical to front line executives.

According to Weinberg it covers math, science, reading and "lots of writing and correspondence skills". She describes participation as a win-win situation for all concerned." Employees get skills to take home and the company gets better employees. Workers grow with the job and this makes them more valuable to the company. Their self-confidence grows and it reflects in their work."

Marta Kaufmann points out that MCCC plays an important role in all aspects of economic development in the county. "We are an important resource for the economic vitality of Mercer," she says. "We are the experts. Our function is critical to the economic health of the community."

Thomas Edison State College, known as the college without a campus, was created by the state board of higher education in 1972 to meet the particular needs of

BEST COPY AVAILABLE

adult students who, for various reasons, found it inconvenient to attend the more traditional colleges. At Edison, knowledge accumulated over a lifetime helps lead to degrees.

The average age of students at Edison is 39 and, according to Linda Holt, the director of communications and college relations, there are several ways they can work toward degrees, using just one method or a combination. The school has developed its own tests, now used nationally and internationally, which allow adults to earn credits for what they know about certain subjects, as does the school's Portfolio Assessment Program. People who have participated in educational programs run by employers or by the military may be credited for those.

Students may choose to participate in semester length guided study courses. Computer and video courses are popular ways to work toward degrees. Those on the CALL Network interact with faculty mentors and at the end of each course go to a testing site and take an exam, all done at their convenience.

Correspondence courses from accredited colleges are another mode of study. Some students enjoy taking classes at other colleges and transferring the credit.

The college now numbers 9000 students. While most are from New Jersey, just about every other state is represented, as well as 65 foreign countries. Edison has about 150 employees and a consulting faculty of 280, usually persons at other colleges who work for Edison on a consulting basis.

Despite Edison's "convenient approach" to higher education, Holt emphasizes that earning a degree there requires much effort and motivation.

While most funding is through the state, the school enjoys the services of a foundation that looks for private funding.

"Each of our graduates is a unique success story," says Holt, who adds that many go on to graduate schools including Princeton and Harvard..

The lingering recession has brought an increase in Edison's enrollment. "Many people are now thinking of changing careers and they are here to do that," says Holt. "This is probably the most economical way to complete a higher education degree. It's very reasonable." Costs vary according to degrees sought as well as previous credits. The college lists $1,250 as an average cost for state residents to earn an associate degree.

In the midst of an uncertain economy and a volatile job market, many people consider that a real bargain. ❑

PORTRAITS
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Michael G. Stebbins, M.D.

Businesses Help Educate Workers

By ELISABETH GINSBURG

JOHN COPANEC JR., 24, an employee of the Hibbert Group in Trenton, thought he had left education behind at the end of high school six years ago. Then he signed up for a refresher course in basic math that was taught at his workplace by an instructor from Mercer County Community College, and his attitude changed.

"The math course worked so well that I went on," he said. Since finishing his first course, Mr. Copanec has taken classes in public speaking, reading comprehension and writing at Hibbert, a marketing and commercial printing company.

He has been promoted from his entry-level receiving job to the position of account coordinator for one of the company's major clients and hopes to start work on an associate's degree in business in January. Mr. Copanec said the workplace courses had reawakened his desire to learn and increased his loyalty to his employer.

He is not alone. Companies in New Jersey and across the country have begun workplace education programs to remedy employees' educational deficiencies and prepare them to meet the demands of changing technologies. It is notable that this investment in education has come at a time when lean bottom lines and shrinking work forces have become the norm.

Report on Lack of Literacy

A new report on the state's adult literacy problem makes depressing reading. "Adult Literacy in New Jersey — Meeting the Challenge of the 20th Century" was issued in October by the seven-month-old New Jersey Council on Adult Education and Literacy. Extrapolating from data gathered from the United States Department of Education's National Adult Literacy Survey, the council estimated that 1.2 million to 1.4 million New Jerseyans function at the lowest literacy level.

These people, according to the report, "may not be able to locate one piece of information in a sports article, locate an intersection on a map or total a bank deposit entry." The report also notes that an estimated 43 percent of New Jerseyans who seek jobs or unemployment insurance have "literacy deficiencies."

Although industry-based education is not new, changes in the work force have made the problem it tackles bigger and more complex than it was five years ago, or even one year ago.

Many workers still need help with basic literacy skills. The number of people who require instruction in English as a second language is increasing rapidly. In a third large category of workers, the employees have basic literacy skills but need specialized courses to help them deal with advancing technology on the job.

Elaine Weinberg, director of workplace literacy at Mercer Community College, has developed education programs for many Mercer County companies. She estimates that in those companies, 15 percent of the employees need help with basic literacy skills and 65 percent need "job-specific" education. Literacy in the workplace, Ms. Weinberg said, encompasses "skills needed by employees now and in the future."

Reluctant to Admit Problem

Helen Archontou, director of the Bergen County chapter of Literacy Volunteers of America, said the health care and hotel hospitality industries had the most pressing need for workplace literacy training, because large numbers of unskilled workers and recent immigrants are attracted to jobs in those areas.

> Many employees need assistance with basic literacy skills.

Some companies offer literacy training, but many "don't like to admit there is a problem," said Emily Bledsoe, director of the Bergen County chapter of PLUS (Partners in Literacy US).

Large and small employers are faced with the need to spend scarce capital on education today in order to have better educated workers in the future. To do the job as effectively as possible, many are seeking help from outside the business community.

That help sometimes comes from community colleges. "We have built up experience with our own credit students," said Ray Campari, director of the Business Assistance Center at Cumberland Community College in Vineland. Community college officials like Mr. Campari seek out local employers to find opportunities to set up workplace education programs.

"We knock on doors of industries to find out their needs," Mr. Campari said. Once those needs become clear, college administrators develop what Ms. Weinberg calls "need-based curriculum." Classes are held either at the workplace or at the community college.

Mr. Campari estimates that in the last year, 20 percent of the classes set up by Cumberland Community College in local companies were devoted to basic literacy skills and the rest to job-specific knowledge.

Ms. Weinberg and her colleagues at Mercer Community College were able to set up programs at several Mercer County industries by obtaining "workplace literacy grants" from the United States Department of Education. The grant money paid for the teachers, and the companies contributed by allowing workers to take courses on company time.

Contributions by Companies

Ms. Weinberg and Mr. Campari agree that companies that pay for all or part of the time an employee spends in class find that many more workers are willing to sign up. "Because of the economy, many cannot do it on their own time," Ms. Weinberg said.

Industries with programs financed by workplace literacy grants and administered by Mercer Community College agreed to "institutionalize" the education programs once a grant has been spent. Ms. Weinberg said one such company was forming a consortium with other local industries to provide customized training programs. Similar consortiums may be a wave of the future, she said.

Another rapidly swelling wave in industry-based education is instruction in English as a second language, or E.S.L. Workers who benefit from this kind of instruction range from Korean executives at Samsung in Ridgewood Park to the recent immigrants who work in the food processing plants in Cumberland County.

"We can't get enough E.S.L. volunteers," Ms. Bledsoe of PLUS said.

Margery Oppenheimer, state director of the Literacy Volunteers of America, estimated that E.S.L. clients would soon account for more than 50 percent of the agency's business.

Samsung, an electronics manufacturer, will soon begin exploring the possibility of coordinating its in-house E.S.L. program with Literacy Volunteers and Bergen Community College.

Peter Altuch, general manager for human resources at the company, said Samsung currently uses a private instructor to teach English as a second language to its workers, about 25 percent of whom are Korean-born. Mr. Altuch, who is also the newly elected president of Bergen County PLUS, said Samsung's commitment to literacy went beyond E.S.L. classes for its own employees to encouraging adult literacy in the community.

"Our business can make contribu-

tions to literacy education with product donations, contributions and closed-caption television," he said. The company's Korean owners, he said, are likely to support such efforts because of the high value placed on education in Korea and because of their own interest in having an educated work force in the American communities where Samsung plants are situated.

Literacy Not Only Area

Such corporate altruism is not rare. Mr. Altuch said Sony was recently recognized by Bergen County PLUS for its outstanding contributions to literacy. On a statewide basis, Panasonic and Schering Plough are the largest corporate sponsors of Literacy Volunteers of America.

In the broadest sense, industry-based education can also encompass businesses that do not need literacy programs. Two years ago, Mutual of New York (MONY), which has offices in Bergen County, paid $250 a volunteer to have its employees trained by Literacy Volunteers of America. The MONY tutors, like Phyllis Doloff, an assistant vice president, were also allowed to use MONY's offices after hours for one-on-one tutoring sessions.

Ms. Weinberg, Ms. Bledsoe and others say they believe that the future of industry-based education lies in partnerships among business, government and industry. The key to success, according to the Adult Education and Literacy Council's report, is coordination.

The council recommends, among other things, that the seven state agencies represented on the council work together to make policy. The report also suggests yearly conferences on workplace education and the establishment of a clearinghouse for information on workplace education to be accessible through the state library system.

Literacy experts agree that the problem of an undereducated work force will not be solved by trying to assign blame. "We're all responsible for illiteracy," Ms. Bledsoe said.

Ms. Oppenheimer added that technology, with its rapid changes, has outpaced the ability of institutionalized education to keep up, making industry-based programs essential. "Individuals are not getting less intelligent," Ms. Oppenheimer said, "but the demands of the workplace have increased." ■

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Revamped IMC holds seminars

1965

The International Management Council of the Trenton Area YMCA is being reorganized. Regular monthly meetings, with speakers of interest to management of companies in Mercer and Bucks counties, is among the initial steps being taken by the YMCA and former IMC members.

Elaine S. Weinberg, director of Mercer County Community College's workplace skills program, will be the leadoff speaker for the rejuvenated IMC this evening at 6 at Michael's Restaurant, located on the business stretch of Route 1 in Morrisville, Pa. Her topic: "Workforce Education for Hourly Employees — Why Their Training Makes You Smarter." The cost is $25. Contact Bill Beitel Jr. at (215) 736-2100.

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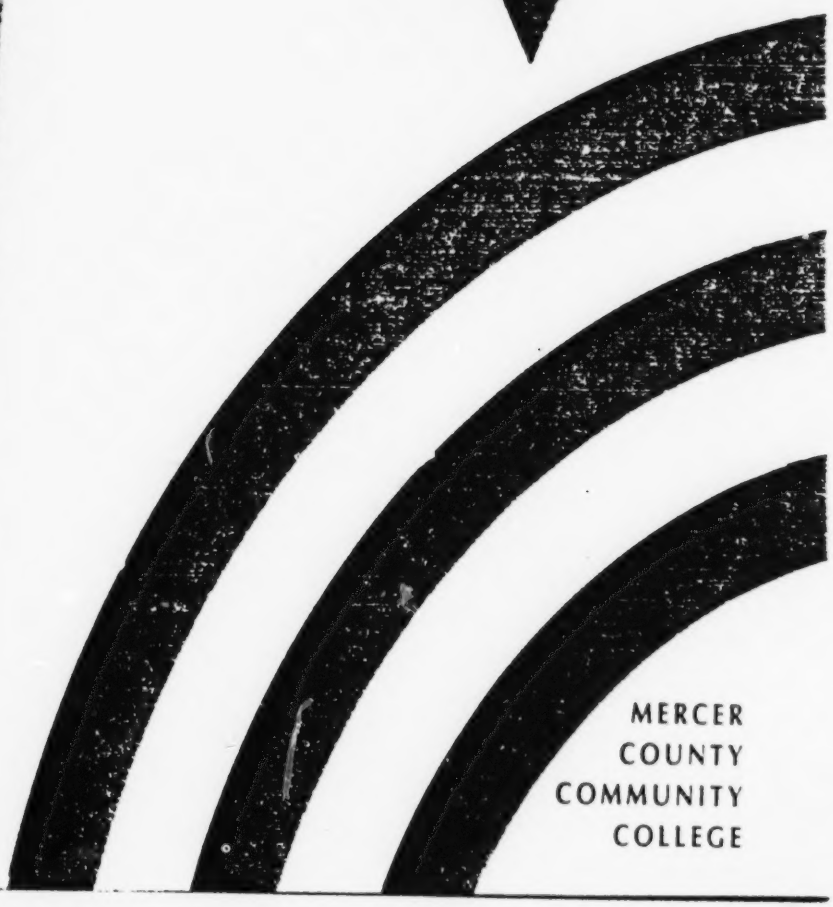

MERCER
COUNTY
COMMUNITY
COLLEGE

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Workplace Skills Program

A literate workforce is the key to any company's success. The Workplace Skills Program is the first step in upgrading employee basic skills to maximize productivity. Workplace Skills focuses on improving reading, writing, communication, math, English as a Second Language, critical thinking and problem-solving skills. Working with management to identify needs, the Workplace Skills Program bridges the gap in skills that will be required now and in the future. Using simulated work-related situations, employees learn to adapt to the changing workplace.

Recommended if you:

- Require skill upgrading as technology changes
- Identify reading and writing skills that hinder quality
- Need higher level literacy and numerical skills for your employees
- Detect problems with smooth communication between English and non-English-speaking employees

Workplace Education offers:

- Proven track record in two model programs through the US Department of Education
- Specific skills to increase workers' productivity and safety in the workplace
- Customized, industry-specific training
- Instructors experienced in work-based education
- Training on-site, during any shift
- Work-based English as a Second Language
- Language, communication and math skills programs

You gain:

- Employees with better communication skills
- More competent employees
- Increased employee retention
- Job-focused curriculum customized for specific industry
- A more flexible workforce

How to access:

Elaine Weinberg, Director
Workplace Skills Project
609-586-4800, Ext. 612

BUSINESS AND INDUSTRY TRAINING

For over a decade, Mercer's ***Center for Training and Development*** has been helping local business, industry, and government agencies become more productive. Now, more than ever before, organizations recognize that the only way to get and maintain that competitive edge is to maximize the contribution of each employee. Whether you're competing domestically or internationally, make certain that your human resources have the knowledge and skills to be top performers.

The ***Center for Training and Development*** can help you by conducting needs analyses and recommending plans of action or by simply offering training courses you believe meet your needs. Below are a few examples of our programs and services.

Center for Training and Development

Telephone Directory (609) 586-4800

Raylie Dunkel ..... ext. 279
Nunzio E. Cernero ..... ext. 291
Elaine S. Weinberg ..... ext. 612
Janet M. Alu ..... ext. 280

Total Quality Management

Mercer County Community College is prepared to help any organization in the development, delivery, or maintenance of their TQM program. ISO 9000, SPC or Employee Empowerment Programs. We also will assist you in TQM support programs in technical and craft development subjects, workplace literacy, and English as a Second Language. **Contact Raylie Dunkel.**

Workplace Development Partnership Program

Mercer County Community College has been identified as a leader in this county in the dissemination of $25 million in training funds under the new WDPP legislation. We welcome the opportunity to work with you to explore how to utilize these funds to make your business operation more productive. **Contact Raylie Dunkel.**

Micro, Mini & Mainframe Computer Training

We train thousands of people each year on using personal computers and programming mini- and mainframe computers. We have extensive experience teaching all of the major software packages. Our laboratories have equipment utilizing all the major operating environments. We have instructors with expertise in all programming languages. We even have a mobile personal computer laboratory that can be brought right to your site. **Contact Raylie Dunkel.**

Management and Supervisory Development

MCCC is the only community college in the state to be licensed and certified to offer the Zenger-Miller ***FrontLine Leadership*** and ***Working*** programs. ***FrontLine Leadership*** is designed for managers and supervisors who strive to empower employees to reach new heights of productivity. ***Working*** is designed to help staff recognize the value of improved internal and external customer relations and develop a sense of self-empowerment. In addition, MCCC has custom-designed a full-range of management and supervisory development programs for area organizations. **Contact Nunzio Cernero.**

The First Step—Workplace Basic Skills

We offer programs for employees in basic math, reading, writing, and English as a Second Language. These courses lay the groundwork for technical skills development essential in an evolving workplace. **Contact Elaine Weinberg.**

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LETTERS OF COMPANY INTENT

The Hibbert Group
Trenton Denver
Comprehensive Marketing Services

May 23, 1994

Ms Elizabeth Miller
U.S. Department of Education
Washington, DC

Dear Ms. Miller:

I would like to express our thanks and sincere appreciation to the federal government for awarding us a Federal Work Place Literacy grant.

Throughout the 18 months of the grant, more employees were placed in the classroom setting thanwe ever thought possible.

The benefits of the grant were far reaching. Employees developed skills in many areas, and we were able to see a significant impact in the workplace.

Even though the grant is officially completed, our plans for training and development are continuing. Many employees now have the desire to continue with their training, thanks to the positive outcome of the grant.

We had an excellent partnership with Mercer County Community College. Their professionalism and commitment to education was demonstrated in the outstanding quality of education provided to our employees.

Very truly yours,

Diane Allen

Diane A. Allen
Vice President
Human Resources

DAA:jsj

400 Pennington Avenue P.O. Box 8116 Trenton, New Jersey 08650-0116 609/394-7500 Fax 609/392-1237

TRANE

Trenton Operations
The Trane Company

2231 East State Street
Trenton NJ 08619
609 587 3400

May 23, 1994

Elizabeth Miller, Grants Officer
U.S. Department of Education
400 Maryland Avenue South West
Building: Switzer 4512
Washington, DC 20202-7327

Dear Ms. Miller:

The Trane Company participated in the Workplace Literacy Program as a partner with the Mercer County Community College.

Our grant was for $224,000 which made a substantial impact on the educational deficits of our employees. As you know, the funding paid for equipment and instructional costs through Mercer County Community College. The Company was very pleased with the results of the program and we are committed to continue these programs in the future to help our employees and, therefore our company, to be the best we can be.

On behalf of the Trane Company and the men and women who work here in the Trenton operation, thank you very much.

Sincerely yours,

John A. Adams/jas

John A. Adams
Human Resources Manager

JAA:jas